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Matters related to the implementation of the Convention: effectiveness evaluation

Report on the effectiveness evaluation of the Stockholm Convention on Persistent Organic Pollutants

Note by the Secretariat

As referred to in the note by the Secretariat on the effectiveness evaluation of the Stockholm Convention on Persistent Organic Pollutants pursuant to Article 16 (UNEP/POPS/COP.8/22), the report on the effectiveness evaluation of the Stockholm Convention on Persistent Organic Pollutants prepared by the effectiveness evaluation committee is set out in the annex to the present note. The executive summary of the report is also reproduced in the six official languages of the United Nations in document UNEP/POPS/COP.8/22/Add.1. The present note, including its annex, has not been formally edited.

* UNEP/POPS/COP.8/1.

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Annex

Report on the effectiveness evaluation of the Stockholm Convention on Persistent Organic Pollutant

January 2017

Report of the Effectiveness Evaluation Committee

Effectiveness evaluation of the Stockholm Convention pursuant to Article 16

UN environment

Stockholm Convention

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Acknowledgements

This document has been developed by the Effectiveness Evaluation Committee, in accordance with the mandate given by the Conference of the Parties to the Stockholm Convention, under the guidance of its Chair, Ms. Anne Daniel (Canada) and Vice-Chair, Mr. Linroy Christian (Antigua and Barbuda).

The members of the Committee are gratefully acknowledged for the contribution in the development of this report: Mr. Linroy Christian (Antigua and Barbuda), Ms. Nermina Skejović-Hurić (Bosnia and Herzegovina), Ms. Anne Daniel (Canada), Mr. Ivan Holoubek (Czech Republic), Ms. Elham Refaat Aziz and Ms. Manal Samy (Egypt), Ms. Kyunghee Choi (Republic of Korea), Mr. Abdul-Ganiyu Yunuss (Nigeria), Mr. Said Ali Issa Alzedjali (Oman), Mr. Ramon Guardans (Spain), Ms. Alejandra Torre (Uruguay), Mr. Tom Harner (Global Monitoring Plan Coordination Group), Mr. Andrew Gilman and Ms. Fatoumata Keita Ouane (international experts appointed by the Secretariat).

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Executive Summary

I. Introduction

1. The objective of the Stockholm Convention adopted on 22 May 2001 is to protect human health and the environment from persistent organic pollutants (POPs). The Convention requires Parties to adopt and implement measures aimed at reducing and/or eliminating the release of POPs into the environment. Where the obligations allow for flexibility, the measures adopted by Parties may vary to some degree, reflecting their differing situations. It is expected, however, that in combination they will reduce and/or eliminate overall releases with consequent benefits for human health and the environment across the globe.

2. Paragraph 1 of Article 16 of the Convention states that, commencing four years after the date of entry into force of the Convention, and periodically thereafter at intervals to be decided by the Conference of the Parties, the Conference shall evaluate the effectiveness of the Convention. Paragraph 3 of Article 16 states that the evaluation shall be conducted on the basis of available scientific, environmental, technical and economic information.

3. As the Convention's impact will be the result of individual and collaborative measures by Parties, any evaluation of that impact must as a practical matter include an assessment of whether the combination of measures adopted by Parties provides, at the aggregate level, a timely improvement in the situation prevailing before the Convention entered into force.

4. The first effectiveness evaluation was completed in May 2009 at the fourth meeting of the Conference of the Parties[1]. However, it was noted that the procedures for the evaluation stage of the effectiveness evaluation were not defined at that time. An ad hoc working group was established to develop possible procedures for this purpose for consideration at the fifth meeting of the Conference[2].

5. At its sixth meeting in May 2013, the Conference of the Parties adopted the framework for effectiveness evaluation along with the terms of reference of an effectiveness evaluation committee with the mandate to undertake the evaluation, draw conclusions and make recommendations on its basis[3].

6. The effectiveness evaluation committee was established by the Conference of the Parties at its seventh meeting to serve until the close of its eighth meeting. The first six-year evaluation cycle takes place between 2010 and 2017.

A. Purpose of this report

7. The purpose of the effectiveness evaluation report is: to assess, in accordance with the framework for effectiveness evaluation, whether the Convention has succeeded in achieving its objective of protecting human health and the environment from POPs; to determine more specifically the effectiveness of the specific measures provided in the Convention to achieve this objective; and to identify ways to improve the effectiveness of the Convention.

8. The Conference of the Parties also tasked the Committee with evaluating the framework itself and making recommendations for changes to the framework. These are provided as a separate report on the effectiveness evaluation framework in document UNEP/POPS/COP.8/INF/41.

B. Information collection, compilation, synthesis and evaluation

9. Key data sources used in this evaluation included those specified in Article 16: reports and other monitoring information, and especially the monitoring reports of the global monitoring plan; national reports (first, second and third reports) and other information on measures taken to implement the provisions of the Convention pursuant to Article 15; and national implementation plans (NIPs) submitted pursuant to Article 7. Since the Conference of the Parties has not yet been able to agree to procedures and mechanisms for the implementation of Article 17 on non-compliance, there was no information on compliance provided pursuant to such procedures.

[1] SC-4/32.

[2] UNEP/POPS/COP.5/31.

[3] UNEP/POPS/COP.6/27/Add.1/Rev.1.

10. The Secretariat collected and compiled the available scientific, environmental, technical and economic information, and any relevant additional sources, and prepared a preliminary analysis, on the basis of which the present effectiveness evaluation report has been developed by the effectiveness evaluation committee. The full list of references is provided in document UNEP/POPS/COP.8/INF/40.

C. Information analysis

11. According to the framework for effectiveness evaluation, the evaluation is to conform to the standards for evaluation in the United Nations system (United Nations Evaluation Group 2005). This report evaluates the overall progress and effectiveness of the Convention from when the Convention or its amendments entered into force for most Parties. When such information was not available (e.g., monitoring data) the first relevant information that was available was considered as the baseline against which changes over time were evaluated.

D. Assumptions

12. Temporal and spatial changes in levels of POPs in the environment are good indicators of whether the objective of the Convention is being achieved since a decrease in those levels over time would decrease exposure to POPs and thus their adverse impacts on human health and the environment. Attributing changes observed to measures undertaken is challenging since most measures are not carried out in isolation.

13. To evaluate the extent to which observed changes could be attributed to the measures undertaken under the Convention, a number of assumptions and concurrent processes were taken into account:

(a) The implementation of national actions to reduce or eliminate the production, use and release of POPs would not have occurred, or would have been less effective or occurred at a later time, if the Convention had not been in place; although measures addressing environmental contamination and human exposure to POPs had already been in place in some regions prior to the Convention, the entry into force of the treaty has expanded such measures to the global level, enabling concerted global action, and a wider scope of action by listing new chemicals;

(b) If implemented, obligations under the Convention would help to protect human health and the environment from the adverse effects of POPs.

E. Challenges

14. The implementation of the Convention depends primarily on actions and activities by Parties, which constitute a large and diverse group of countries. Collecting comparable data from such a group is complex. Parties report on whether measures have been adopted but in most cases data on the extent of implementation or the success of these measures (outcomes) are not readily available, and when available, data are not easily compared between countries or regions. The lack of data on outcomes limits the ability to interpret the information available.

15. National reports were a main source of data for the evaluation. The lack of national reports, their lateness and the inaccuracies they contained seriously hampered the ability of the Committee to undertake this evaluation.

16. The absence of an established compliance mechanism has resulted in large gaps in information on whether Parties are meeting their obligations under the Convention. Such information is crucial in determining whether the Convention is effective in meeting its objective, as it would provide information for determining non-compliance with its provisions. If all Parties move towards full compliance, and there remain significant levels of listed POPs in the environment, then this could suggest that current Convention controls do not sufficiently address the problem of POPs.

II. Evaluation of the effectiveness of the Convention

17. The evaluation is grounded on the Convention's objective to protect human health and the environment from POPs and considers process and outcome indicators. Process indicators measure actions undertaken during implementation. Outcome indicators measure the desired impact of the measures adopted to implement the Convention.

18. The evaluation is structured according to the framework provided by the Conference of the Parties,[4] but grouped by main areas of implementation of the provisions of the Convention. Following the assessment under each Article, there is a synthesis of the outcomes of the effectiveness evaluation and overall conclusions and recommendations of the evaluation.

Overall outcomes of the effectiveness evaluation

19. The effectiveness evaluation report[5] assesses, in accordance with the framework for effectiveness evaluation,[6] whether the Convention has succeeded in achieving its objective of protecting human health and the environment from POPs, and identifies ways to improve the effectiveness of the Convention.

20. The Convention provides an effective and dynamic framework to regulate POPs throughout their lifecycle, addressing the production, use, import, export, releases, and disposal of these chemicals worldwide. However, inadequate implementation is the key issue that has been identified in this evaluation.

21. Mechanisms and processes required by the Convention to support Parties in meeting their obligations have all been put in place, with the exception of procedures and mechanisms on compliance. A key challenge in undertaking this evaluation was the limited data available from national reports and NIPs, and recommendations have been made to address these and other implementation issues.

22. Monitoring results indicate that regulations targeting POPs are succeeding in reducing levels of POPs in humans and the environment. For POPs listed in 2004, concentrations measured in air and in human populations have declined and continue to decline or remain at low levels due to restrictions on POPs that predated the Stockholm Convention and are now incorporated in it. For the newly listed POPs, concentrations are beginning to show decreases, although in a few instances, increasing and/or stable levels are observed.

23. While the effectiveness of the Convention is evaluated through the Convention's provisions, other international collaboration promoting the sound management of chemicals and waste, contributes to the achievement of the objectives of the Convention.

24. The framework for effectiveness evaluation adopted by the Conference of the Parties provided a good basis for conducting the first evaluation cycle, and based on the experience in using the framework, suggestions have been made to improve it for the next evaluation cycles in document UNEP/POPS/COP.8/INF/41.

A. Objective

1. Protecting human health and the environment (Article 1)

25. The outcome to be addressed in assessing the effectiveness of efforts to achieve the Convention objective set out in Article 1 is whether the levels of POPs in humans and the environment have diminished over time. This represents a global outcome indicator of improved human health and environmental protection.

26. The evaluation made use of the second global monitoring report which was developed on the basis of the five regional monitoring reports[7] by the coordination group for the global monitoring plan. The report synthesizes information from the first (2000-2008) and second (2009-2015) phase of the GMP and presents the current findings on POPs concentrations at the global scale.[8]

(a) Main findings

27. For most "legacy POPs" (those 12 substances listed when the Convention entered into force in 2004), concentrations in air have declined and continue to decline or remain at low levels due to restrictions on POPs that predated the Stockholm Convention and have been maintained since. For many "newly listed POPs" (those POPs listed after 2004) concentrations in air in some regions are beginning to show declining tendencies, although in a few instances, increasing and/or stable levels are observed.

[4] UNEP/POPS/COP.6/27/Add.1/Rev.1.

[5] UNEP/POPS/COP.8/INF40.

[6] UNEP/POPS/COP.6/27/Add.1/Rev.1.

[7] UNEP/POPS/COP.7/INF/38.

[8] UNEP/POPS/COP.8/INF/38.

28. In regions with sufficient data to evaluate changes over time, levels of legacy POPs such as polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF), polychlorinated biphenyls (PCB), and DDT/DDE[9], including their transformation products, have generally declined in human tissues. For the newly listed POPs, information regarding changes over time is very limited. Based on studies available from the Western Europe and Others Group and from Asia Pacific, the levels of brominated diphenyl ethers (BDEs) and perfluorooctane sulfonic acid (PFOS) seem to be gradually declining.

29. Temporal trend information for PFOS in water is very limited. Differences in sampling locations and in detection limits preclude any robust assessment of trends for now.

30. For other media, there are clear declines of legacy POPs from the 1970s until 2000 and few changes thereafter. Newly listed POPs (such as BDEs, hexabromocyclododecane (HBCD), PFOS and endosulfan) show increasing trends over the period from 2004 to 2014; the increases in some cases (e.g., PFOS) seem to have slowed down or stabilized and some decreasing trends are also detected.

(b) Conclusions and recommendations

31. Monitoring data suggest that the continued existence of targeted regulations, including those that predated the Convention in some regions, is working towards reducing levels of POPs in the environment and in human populations. Effective regulatory actions at the global level post-entry into force of the Convention, particularly for listed POPs that are still in commerce, are expected to lower environmental concentrations in the long term.

Recommendation: *Global monitoring of POPs, as well as data sharing and modelling should be sustained in the long term to confirm decreasing concentrations of legacy POPs in the environment and in humans and to identify trends in the concentrations of the newly listed POPs.*

B. Control Measures

1. Measures to reduce or eliminate releases from intentional production and use (Article 3)

32. Article 3 provides measures to reduce or eliminate releases from intentional production and use of chemicals listed in Annex A and Annex B to the Convention. The outcomes to be addressed in assessing the effectiveness of Article 3 in helping to achieve the Convention objective are whether: the production, use, import and export of the chemicals listed have been eliminated (Annex A chemicals) or restricted (Annex B chemicals); and, whether the production and use of new pesticides or new industrial chemicals that have characteristics of POPs have been prevented.

33. Information was collected from either the third, second, first national reports or the NIPs. Of the 180 Parties to the Stockholm Convention, 164 Parties had submitted at least one of the four sources of information. The information on the use of POPs was mainly obtained from the NIPs as it was not asked for in the national reports. As the NIPs outline a plan for implementing treaty obligations, rather than reporting on how they were actually implemented, the information they provide has its limitations. In addition, the evaluation process considered the compilation of information obtained by survey and presented at the fifth meeting of the Conference of the Parties.[10]

34. The amendment to list HBCD entered into force for most of the Parties on 26 November 2014. The amendments to list HCBD, pentachlorophenol and its salts and esters, and polychlorinated naphthalenes entered into force for most of the Parties on 15 December 2016. The information on these chemicals is expected to be reported in the fourth national report to be submitted in 2018 and is not covered in the current report.

35. With regard to DDT, PCB, PFOS, its salts and perfluorooctane sulfonyl fluoride (PFOSF), as well as BDEs (Hexabromodiphenyl ether and heptabromodiphenyl ether (hexa- and heptaBDE), tetrabromodiphenyl ether and pentabromodiphenyl ether (tetra- and pentaBDE)), there are additional separate processes for collecting information and reviewing progress. The information made available through such processes is discussed in separate sub-sections below.

(a) Main findings

36. According to the information contained in the NIPs and in the national reports, a majority of Parties (up to 66% depending on the chemical) provided information on having set up measures, including legal and administrative measures, to control the production, import, export and use of POPs

[9] 1,1,1-trichloro-2,2-bis(4-chlrophenyl)ethane (DDT); 1,1-dichloro-2,2-bis (4-chlorophenyl) ethylene (DDE).

[10] UNEP/POPS/COP.5/INF/9.

listed in Annexes A and B that meet or exceed the Convention's requirements, either before or upon entry into force of the Convention. The percentage of Parties that have implemented measures for the newly listed POPs (21-34%) is lower than that for the legacy POPs (54-66%).

37. According to the information from the NIPs, many Parties have environmental legislation covering hazardous chemicals or pesticides in general, but not specifically the listed POPs. Many of these Parties have not submitted national reports to confirm whether they have developed or revised their regulatory framework and legislation to address listed POPs after transmitting their NIPs.

38. More Parties have implemented legal and administrative measures to control pesticides than industrial chemicals. For legacy POPs, the highest percentage was reported for DDT (65%) and the lowest for PCB (54%). The rate for PCB is lower than for other chemicals, despite the fact that PCB are one of the most widespread industrial POPs across the globe. For the newly listed POPs, the highest percentage was reported for lindane (35%) and the lowest for PFOS, its salts and PFOSF (20%).

39. A decrease in the production, use, export and import was observed for most of the POPs except for PCB, DDT, endosulfan, lindane, and PFOS, its salts and PFOSF. Among the newly listed POPs, Parties reported production, export and import of lindane, endosulfan, pentachlorobenzene, tetra and pentaBDE and PFOS, its salts and PFOSF. Most of the production and use of the initial POPs ceased before 2004, except for PCB and DDT. More than 60% of Parties reported past and ongoing use of PCB. A number of Parties (17 Parties listed in the Register) still have a need for DDT for disease vector control.

40. Even though the majority of the production of POPs pesticides ceased before 2004 and exports and imports have been banned, legacy POPs pesticides are reported to exist as obsolete stocks. Several Parties indicated in their NIPs that obsolete stockpiles of such substances may be illegally used by farmers. Mislabelling or a lack of appropriate labels (for example, because products sold to farmers are repackaged by warehouse staff) are cited as reasons for such illegal use.

41. Some Parties, in particular developing country Parties, indicated that import and use of POPs are banned but there may be illegal trafficking of POPs pesticides with unknown quantities. Indications are also provided that the naming of pesticides used among farmers is often not consistent with the official name. Some POPs pesticides are used as mixtures and the users may not be aware of the contents.

42. Information on quantities imported or exported for environmentally sound waste disposal is scarce. Among all POPs, PCB and DDT were most often exported for final disposal. Most of the reported exports of POPs for final disposal were from developing country Parties or Parties with economies in transition to developed country Parties.

43. A limited number of Parties report regulatory and assessment schemes for new pesticides and/or new industrial chemicals (more for pesticides, 14%, than for industrial chemicals, 12%). Most of the regulatory and assessment schemes take in to account the criteria in Annex D; thus they ideally would prevent production and use of new pesticides or new industrial chemicals that have the characteristics of POPs.

(b) Conclusions and recommendations

44. The increase observed in 2010 and 2012 in the number of Parties that have implemented measures for newly listed chemicals, even though not universal, provides evidence that the entry into force of an amendment for a particular chemical is a trigger for some but not all Parties to amend and implement administrative or legal measures to control the production, use, import and export of the chemical.

45. Many Parties, in particular developing country Parties, provide information in their NIPs on having general environmental legislation covering hazardous chemicals or pesticides, but fewer have legislation and/or regulations specifically designed to implement obligations regarding listed POPs. The percentage of Parties that have implemented measures for the newly listed POPs (21-34%) is lower than that for the legacy POPs (54-66%).

46. Measures to control pesticides are more widespread than for industrial chemicals. In particular, measures to control PCB are lacking in a number of countries, in particular in developing country Parties and Parties with economies in transition.

Recommendation: *Priority attention should be given to developing, enforcing and/or strengthening national legislation and/or regulations implementing the Convention that are appropriate for both*

industrial chemicals and pesticides. For legacy POPs, this recommendation is especially important for developing country Parties and Parties with economies in transition, in order to control in particular industrial chemicals, with regard to their import, export and use. For the newly listed POPs, this recommendation is equally important for all Parties regardless of their economic situation. Parties need to develop or revise their national legislation and/or regulations to specifically implement obligations regarding POPs listed under the Convention.

47. Quantitative information on the production of POPs reported by Parties is extremely limited, such that it is not possible to discuss trends. However, according to the NIPs, most production of legacy POPs ceased before 2004.

Recommendation: *Further development of national inventories should be encouraged among Parties to provide a mechanism for a quantitative global inventory of production, stocks and releases of POPs. Furthermore, modelling and cooperation with other chemical management initiatives should be encouraged as these approaches would contribute to a transparent and reliable global inventory which could then provide useful information on changes over time.*

48. Most of the production and use of the legacy POPs ceased before 2004, except for PCB and DDT. Past and ongoing use of PCB is still widely reported. At the current rate of activity, obligations in the Convention related to 2025 and 2028 will not likely be met by most Parties.

Recommendation: *Parties, which have not already done so, should be vigorously encouraged to implement legal and administrative measures to meet the obligations of the Stockholm Convention related to 2025 and 2028 for the elimination and environmentally sound management of PCB.*

49. Although production of all legacy POPs pesticides (except DDT) ceased before 2004 and all exports and imports were banned thereafter, large stockpiles exist in some Parties that are developing countries and countries with economies in transition and may be illegally used by farmers. These illegal uses may result in an ongoing risk to human health and the environment.

Recommendation: *All Parties should urgently develop inventories of stockpiles and manage them in an environmentally sound manner as required by Article 6. Enactment and enforcement of national legislation and/or regulations is key to this endeavour. Key in developing country Parties in particular is education for farmers about the health and environmental risks of banned pesticides.*

50. Illegal trafficking of POPs pesticides and ambiguity as to the commercial names and the composition of the mixtures in use make sound management of the banned pesticides difficult, especially for Parties that are developing countries and countries with economies in transition.

Recommendation: *Customs officers should receive more harmonized training on POPs pesticides identification and national obligations pertaining to the Stockholm Convention. Users of POPs pesticides and industrial chemicals should be made more aware of their risks and safe handling practices as a further means of reducing illegal trafficking.*

51. Production and/or export and import of several newly listed POPs continue, in particular for lindane, endosulfan, pentachlorobenzene, tetra- and pentaBDE, hexa- and heptaBDE and PFOS, its salts and PFOSF.

Recommendation: *Information on the current use of these chemicals and alternatives should be collected and shared through the Stockholm Convention information sharing and reporting mechanisms in order to accelerate their replacement and reduce their ongoing use.*

52. Information on import is much more limited than that collected on production and export. Further, reports from those exporting a substance to a country did not match the import records of the receiving country.

Recommendation: *Parties should provide validated information on production, import and export of POPs, including quantitative information, in the national reports required pursuant to Article 15.*

53. Among all POPs, PCB and DDT are exported for final disposal in the largest amounts. Taking into account the information related to ongoing use of PCB and DDT, it is probable that these chemicals will continue to be exported for final disposal for several years.

Recommendation: *Exports of DDT and PCB for final disposal should be closely monitored through the use of data gathered through the DDT questionnaire, national reporting under Article 15 of the Stockholm Convention and national reporting under the Basel Convention, in particular for the evaluation of the progress made towards the elimination of PCB as required by the Convention.*

54. While significant progress has been made to control intentional production and/or use of POPs, more remains to be done. Among the legacy POPs, DDT and PCB remain a major concern along with ongoing production and/or use of some newly listed POPs that are still on the market.

Recommendation: *The Secretariat should continue to undertake activities to raise awareness of the obligations of the Convention with respect to the POPs listed in Annexes A and B and provide guidance and assistance for Parties to effectively implement control measures.*

(c) DDT: Main findings

55. Legal measures governing the production, import, export and use of DDT are in place in the majority of Parties. Out of that number, roughly half of them have developed or amended these measures since 2001, indicating major progress due to the Convention. Nevertheless, there are indications that the implementation of legal measures, through pesticide life-cycle management, remains a major challenge in vector-borne disease endemic countries.

56. Global production of DDT declined by 29%, from 4768 tonnes of active ingredient (a.i.) per year in 2003-2008, to 3389 tonnes a.i. per year in 2009-2013. India is the only known remaining producer.

57. Global use of DDT has declined by 35% from 5034 tonnes a.i. per year in 2003-2009 to 3268 tonnes a.i. per year in 2010-2014. India has been the main user of DDT, responsible for 83% of global use in 2000-2014; in recent years, India has been responsible for an estimated 96-97% of global use. India uses DDT for control of malaria and leishmaniasis.

58. The use of DDT for malaria control in Sub-Saharan Africa has been relatively minor as compared to the use in India. Especially, in recent years, the use in Africa is estimated to be less than 100 tonnes a.i. per year; a small fraction of the global use.

59. A number of African countries have alternately discontinued and resumed use of DDT as a result of several contemporary developments, notably the up-scaling of vector control interventions, which included indoor residual spraying with DDT and the development and monitoring of insecticide resistance in malaria vectors.

60. However, insecticide resistance in malaria vectors is sweeping across Africa. This is reducing the choice of readily available insecticidal options for malaria vector control. In southern Africa, in particular, the main malaria vectors have become resistant to both pyrethroids and carbamates. This leaves only DDT and much more expensive organophosphates as immediate options for insecticidal control and for insecticide resistance management. Alternative vector control methods included in the Handbook for Integrated Vector Management (IVM) of the World Health Organization (WHO), such as house improvement and larval source management, deserve increased attention in future IVM strategies.

61. Regarding the import and export of DDT, global import for use in disease vector control shows an increase from 2001-2005, but imports reduced to much lower levels in recent years. Data on import and export do not tally and require more consistent reporting by Parties. A number of countries reported export of DDT for final disposal; destinations were mostly countries in Europe. Reporting on import for final disposal has been poor.

(d) DDT: Conclusions and recommendations

62. In several African countries, recent capacity building on entomological surveillance and insecticide susceptibility monitoring has prompted a timely policy change away from the use of DDT. The effectiveness of the Stockholm Convention towards achieving its global objectives regarding DDT could be further improved by focusing efforts to reduce the current high levels of DDT use in some countries. Indications of increased use of DDT for leishmaniasis control and the spread of emerging vector borne health threats point to the need for adoption of more integrated vector control methods and more education about the benefits for local communities of reducing reliance on DDT, and in developing safer, technically feasible, accessible, more effective and affordable non-POPs alternatives.

Recommendation: *Further capacity building is needed to improve entomological surveillance, evidence-based decision making and fine-tuned targeting of vector control interventions that would reduce the use of DDT. Integrated vector management which will lead to substantial benefits for the global environment should be encouraged.*

63. The road map for the development of alternatives to DDT (the key elements of which were endorsed by the Conference of the Parties at its seventh meeting)[11] provides the required framework for using safer alternatives than continued use of DDT.

Recommendation: *Further support is needed for the development of safer, effective and affordable alternatives to DDT and for strengthening the capacity of Parties still relying on DDT to commence a sustainable transition away from DDT.*

64. Data on import and export of DDT contained in national reports do not match. Data on import for final disposal are especially poor.

Recommendation: *Existing reporting mechanisms for DDT should be improved so that the data can be used for the specific requirements for effectiveness evaluation under the Convention, particularly the mechanism for reporting on export and import of DDT for use in disease vector control or for final disposal. In addition, collaboration with the Basel Convention's reporting system related to imports and exports for final disposal and the WHO's reporting system on public health pesticides in relation to DDT should be explored.*

(e) PCB: Main findings

65. An estimated 1 to 1.5 million tonnes of technical grade PCB have been produced, with each tonne of technical grade PCB having generated at least 20 tonnes of waste containing or contaminated with PCB at relevant concentrations.[12]

66. The amount of liquids and equipment containing or contaminated with PCB eliminated by the Parties to the Stockholm Convention to date is estimated at approximately 3 million tonnes. Actual amounts eliminated could be much higher, most notably because quantitative data was not available for a large number of countries. Approximately 70% of the progress in elimination was made after the entry into force of the Convention in 2004.[13]

67. The amount of PCB liquids and equipment that still need to be eliminated is estimated to be about 14 million tonnes, most of which is found in transformers. Information on other applications including, in particular open applications, is limited. It is highly probable, at least in part due to low reporting rates, that the actual amounts still to be eliminated are much larger. Currently no mechanism is available under the Convention to review and monitor progress in implementation of the PCB provisions.

68. The amounts already disposed of and scheduled for disposal under the global environmental facility (GEF) projects is very small compared to the estimated total amounts still to be eliminated. Given the large amounts that still need to be eliminated, it is necessary to increase the cost-effectiveness of interventions by designing projects in a way as to strengthen human and infrastructure capacities in the long term, beyond the duration of the project.

69. Technologies and capacities for the elimination or irreversible transformation of PCB are available, with many countries already having eliminated substantial amounts of PCB either domestically or via export.

(f) PCB: Conclusions and recommendations

70. The Stockholm Convention, through the development of NIPs, as well as the many GEF-funded projects, had a beneficial impact on raising awareness of PCB, building national capacity and in eliminating PCB-containing liquids and equipment, but progress toward PCB elimination is slow. While some progress has been made towards the elimination of PCB, the majority of Parties are currently not on track to identify, label and remove from use equipment and liquids containing PCB by 2025 and to manage waste liquids and equipment containing PCB in an environmentally sound manner by 2028 and the number of tonnes remaining to be disposed of globally is daunting. A strong argument can be made that the scope of the challenge of achieving the elimination of use of PCB by 2025 and the environmentally sound management of PCB by 2028 has been severely underestimated at least in part due to poor reporting.

Recommendation: *There is a need, in particular for developing country Parties and Parties with economies in transition, to strengthen their national or regional capacities for the elimination or irreversible transformation of PCB congeners and formulations.*

[11] UNEP/POPS/COP.7/INF/6; UNEP/POPS/COP.7/5, annex II.

[12] UNEP/POPS/COP.8/INF/10.

[13] Ibid.

Recommendation: *Parties should urgently define rigorous plans for the environmentally sound management of PCB throughout its life cycle, including its elimination and destruction, and explore the optimal and most cost-effective solutions given the specific background and circumstances of each individual country.*

71. Most national inventories of PCB are preliminary in scope and provide a fragmented picture. Even for closed applications, comprehensive data are often lacking. Currently no mechanism is available under the Convention to review progress in implementation of the PCB provisions.

Recommendation: *PCB inventories need to be undertaken in a systematic manner, in accordance with the existing guidance, and cover all types of equipment, sectors and geographical areas. Each Party should ensure that their national reports contain comprehensive, clear, reliable and well-structured data on the amounts of PCB already eliminated and, most importantly, the amounts still to be eliminated. It may be useful to establish a mechanism under the Convention to review progress in PCB elimination.*

72. The costs of eliminating the large amounts of PCB which remain are significant. Despite the current level of financing to this issue, substantial additional funding will be necessary to eliminate and destroy the amounts of PCB in use or stored if the objective of the Convention is to be met.

Recommendation: *GEF projects should be designed to strengthen human and infrastructure capacities for PCB elimination and destruction which will last beyond the duration of the project. Initiatives to manage PCB in an environmentally sound manner should also be designed to develop sustainable infrastructure, processes and techniques that can be used for the transportation, storage and destruction of other hazardous wastes particularly POPs wastes.*

(g) Brominated diphenylethers:[14] Main Findings

73. Limited information has been provided on the progress Parties have made towards eliminating BDEs. Several Parties report that currently there is a lack of information on environmentally sound disposal and recycling operations for BDEs. According to one study on the existence of BDEs in products and recycling processes, the materials containing BDEs are mainly in electrical and electronic equipment and cars.

74. The main challenges identified at the seventh meeting of the Conference of the Parties in the elimination of BDEs include: information gaps related to the life cycle of BDEs (in particular for imported products); a paucity of studies to identify the presence of BDEs in products and recycling processes; understanding the activities taking place at waste management and recycling facilities and identifying best management practices; the task of separation of BDEs from the wastes fraction; and, the lack of effective techniques for the screening of BDEs in the waste stream.[15]

(h) Brominated diphenylethers: Conclusions and recommendations

75. To date, limited information has been reported by Parties on progress made towards eliminating BDEs. The specific exemption for the recycling of BDEs listed in Annex A is available until 2030 at the latest, and the second evaluation of the progress that Parties have made towards eliminating BDEs and the review of the continued need for the specific exemptions will take place at the eighth meeting of the Conference of the Parties.

Recommendation: *In order to evaluate the progress made in elimination of BDEs, Parties and observers should provide quantitative information on articles containing BDEs, including in recycling and waste streams.*

Recommendation: *The guidance documents made available at the seventh meeting of the Conference of the Parties should be completed in consultation with the Basel Convention so that they can be used widely to develop more comprehensive inventories of BDEs and help with the application of best available techniques and best environmental practices for the recycling and waste disposal of articles containing BDEs.*

[14] Hexabromodiphenyl ether and heptabromodiphenyl ether (hexa- and heptaBDE), tetrabromodiphenyl ether and pentabromodiphenyl ether (tetra- and pentaBDE).

[15] UNEP/POPS/COP.7/8, annex IV.

(i) PFOS, its salts and PFOSF: Main findings

76. Due to stricter legislation and control worldwide, there has been a significant drop in the production and use of PFOS, its salts and PFOSF from 2003 until today.[16] The most important global producer phased out the production of PFOS, its salts and PFOSF in 2003. Quantitative data on production have been available from this single major global producer so far, but it is considered that the combined capacity of the other producers was much less. The production volumes fell from around 3500 tonnes per year in 2000 to approximately 200 tonnes per year in 2001 and 2002; production was discontinued in 2003. The European Union Scientific Committee on Health and Environmental Risks notes that use of PFOS and PFOS related substances in consumer applications such as carpets, leather/apparel, textiles/upholstery, paper and packaging, coatings, industrial and PFOS household cleaning products, pesticides and insecticides has been largely abandoned following the announcement of the main global producer to phase out manufacture and use of PFOS consumer applications. Uncertainty however remains as to the current levels of use taking into account the limited quantitative data available.

77. Providing a global overview of the production and use of PFOS, its salts and PFOSF is currently challenging. Data gaps are notable in developing country Parties and Parties with economies in transition. A majority of Parties are in the process of updating their NIPs, through which initial information on the national situation may become available.

78. Identification of products that contain PFOS is difficult, particularly in imported products. This makes it more difficult to follow the substance through its life cycle to its end of life (waste) management, and potential release to the environment.

(j) PFOS, its salts and PFOSF: Conclusions and recommendations

79. While a significant drop in the production and use of PFOS, its salts and PFOSF has clearly been achieved, limited information and data prevent this evaluation from providing a comprehensive global overview of production and use.

80. Phasing out the use of PFOS, its salts and PFOSF is challenging due to the paucity of information on alternative substances or methods, the lack of financial resources and insufficient technical capacity.

Recommendation: *Parties that are developing countries and countries with economies in transition need to build their capacity to identify and collect information on PFOS, its salts and PFOSF, to strengthen the legislation and/or regulations to manage the chemicals throughout their lifecycles, and to introduce safer, effective and affordable alternatives to PFOS, its salts and PFOSF.*

(k) Lindane and endosulfan: Main findings

81. Safer and effective alternatives to lindane and endosulfan are commonly available. Many Parties have successfully instituted regulatory actions for banning or restricting the use of these two chemicals.

(l) Lindane and endosulfan: Conclusions and recommendations

82. Safer and effective chemical and non-chemical alternatives to lindane and endosulfan are available.

Recommendation: *Guidance and technical assistance along with activities to raise awareness about the need to use alternatives, given the control measures on lindane and endosulfan, and approaches for phasing-in alternatives are further needed to ensure full transition from the reliance on these chemicals.*

2. Measures to reduce or eliminate releases from unintentional production (Article 5)

83. The outcome to be addressed in assessing the effectiveness of Article 5 is whether the total quantities of POPs that are produced unintentionally and released into the environment have been reduced or, where feasible, eliminated. Periodic inventories of releases of unintentionally produced POPs could also help in interpreting data on levels of POPs collected under the global monitoring plan.

[16] UNEP/POPS/COP.7/INF/11.

84. Article 5 provides measures to reduce or eliminate releases from unintentional production of chemicals listed in Annex C to the Convention. Among the POPs listed in Annex C, PCDD/PCDF are indicative of other unintentional POPs and can be used as a basis for identifying and prioritizing sources of unintentional POPs, as well as for evaluating the efficacy of adopted mitigation measures. Therefore, PCDD/PCDF releases are considered as the key indicator for evaluating the efficacy of Article 5 of the Convention.[17]

(a) Main findings

85. The Convention has acted as a trigger for initial action planning to minimize and ultimately eliminate releases of unintentional POPs worldwide. A majority of Parties (62%) have developed their national action plans further to the entry into force of the Convention, but only a limited number of Parties (20%) have reviewed and updated their national action plans pursuant to paragraph (a) (v) of Article 5. Information relevant to the actual implementation of the action plans under Article 5 is limited.

86. The Toolkit for Identification and Quantification of Releases of Dioxins, Furans and Other Unintentional POPs under Article 5 of the Stockholm Convention on POPs is continuously updated based on systematic expert consultation, and can be considered as the most advanced and comprehensive compilation of emission factors for unintentional POPs. This is also confirmed by studies showing that modelling of global dispersion of PCDD/PCDF using a global inventory of emissions compiled under the Stockholm Convention reasonably reproduces observed levels of air concentrations.

87. Only one third of the Parties to the Convention seem to have phased in measures that promote (30%) or require (28%) best available techniques and best environmental practices to control their releases of unintentional POPs from priority sources, while stating lack of capacity and financial resources as the reason.

88. A minimal change (0.1%) is observed between global baseline releases (2001-2011) and updated releases (2001-2015). Overall, total releases have a positive correlation with the size of the population and a negative correlation with the economic status of the country.

89. The highest contributor to global air releases is open burning, followed by waste incineration, the metallurgical industry, and heat and power generation. Open burning is the highly dominant source of release to air in Africa, Asia Pacific and Latin America and the Caribbean, while heat and power generation along with the metal industry are the major contributors to air releases in the Central and Eastern Europe and Western European and Others Group.

90. The rate of annual decrease in releases in Central and Eastern Europe and Western European and other countries is lower than in other regions, as emissions had already been reduced prior to the entry into force of the Stockholm Convention under the obligations of the POPs Aarhus Protocol adopted in 1998 under the United Nations Economic Commission for Europe Convention on Long Range Transboundary Air Pollution (CLRTAP). Current releases in these regions are very low. Larger decreases are observed in the other regions, where action to minimize such releases was taken more recently pursuant to the Stockholm Convention.

(b) Conclusions and recommendations

91. Releases of unintentional POPs have been successfully reduced in some regions by regulations that predated the Convention and have been maintained since. By requiring similar actions to be taken at the global level, the Convention is expected to result in decreasing levels of unintentional POPs releases in all regions of the globe. Currently less than one third of the Parties are promoting or requiring best available techniques and best environmental practices to control their releases of unintentional POPs from priority sources.

Recommendation: *Parties should develop and maintain up-to-date their action plans to minimize and ultimately eliminate releases of unintentionally produced POPs. Actions should be taken to enhance implementation of requirements for the use of best available techniques and best environmental practices for the priority sources identified.*

[17] UNEP/POPS/COP.7/INF/19.

92. Inventories of sources and releases provide the main basis for assessing the effectiveness of Article 5 of the Convention. Overall, release estimates reported pursuant to Article 15 or through the NIPs, are difficult to compile, process, and most of all, analyze due to a number of limitations. In particular, to enable the assessment of trends over time, comparable data are needed for at least two points in time. The Toolkit for Identification and Quantification of Releases of Dioxins, Furans and Other Unintentional POPs under Article 5 of the Stockholm Convention on POPs provides useful guidance to this end.

Recommendation: *Parties should pay more attention to issues related to quality assurance/quality control (QA/QC) of inventories and consistency and comparability of data reported for various reference years. The process for updating release estimates in order to reveal trends over time should be considered in conjunction with the revision (recalculation or correction) of previous release estimates. The Toolkit for Identification and Quantification of Releases of Dioxins, Furans and Other Unintentional POPs under Article 5 of the Stockholm Convention on POPs should be used for this purpose.*

93. Time series data confirming trends over time in releases of unintentionally produced POPs are limited, particularly for developing country Parties, but some initial results showing decreases over time have been obtained to date.

Recommendation: *Parties should develop and update their inventories of unintentional POPs, and provide the information as part of their national reports to confirm the success of the measures they have taken to implement Article 5.*

3. Measures to reduce or eliminate releases from stockpiles and wastes (Article 6)

94. The outcome to be addressed in assessing the effectiveness of Article 6 is whether there has been a reduction in the levels of POPs being released into the environment from stockpiles and wastes.

95. The information relevant to Article 6 was collected from the third, second, or first national reports or the NIPs. As of 30 April 2016, of the 180 Parties to the Stockholm Convention, 164 Parties had submitted at least one of the four sources of information.

96. The Conference of the Parties to the Basel Convention has adopted (decision BC-12/3) several guidance documents on POPs in waste to assist Parties. In addition, the Conference of the Parties to the Basel Convention adopted, on an interim basis, technical guidelines on transboundary movements of electrical and electronic waste and used electrical and electronic equipment (decision BC-12/5).

(a) Main findings

97. While some Parties have made progress in terms of developing strategies, measures and actions in the area of management of stockpiles and wastes, to identify stockpiles, products and articles in use, and wastes containing POPs, only a limited number of Parties report having such measures in place and even more limited information is available regarding the type of the measures or on the identification and disposal of wastes containing POPs.

98. Quantitative information on stockpiles and POPs wastes being managed in an environmentally sound manner is limited, but sufficient to point to the need for further action. For PCB, only an estimated 17% of the total global mass has been eliminated.

99. Among the legacy POPs listed under the Convention, PCB and DDT are most often exported for final disposal, followed by toxaphene, dieldrin, and heptachlor. Most of the reported exports for POPs for final disposal were from developing country Parties or Parties with economies in transition to developed country Parties. Taking into account the information on ongoing use of PCB and DDT, it is possible that those chemicals will continue to be exported for final disposal in coming years.

100. Information is even more scarce for the newly listed POPs (BDEs and PFOS), as their identification in products is difficult, particularly in imported products. This makes it more challenging to follow the substance throughout its life cycle including its end of life management.

101. Identification and appropriate management of contaminated sites has been triggered by the Convention. 39% of the Parties to the Convention indicated they have identified contaminated sites, even though, according to the Convention's provisions, they are only required to endeavour to develop strategies to identify such sites. A limited number of Parties (18%) have voluntarily undertaken remediation activities, as these are not required by the Convention. When such remediation is undertaken, however, the Convention requires that it be done in an environmentally sound manner, and therefore Parties could benefit from help in developing competencies, cooperation and mobilization of resources to avoid further releases.

(b) Conclusions and recommendations

102. Due to the nature of wastes whereby most of the data collected are limited and restricted to a particular point in time in the life-cycle, and considering that wastes contain mixtures of substances, it is difficult to identify a specific quantity of wastes containing a specific POP which has been destroyed. In view of the limited data available, it is difficult to provide a quantitative global picture of wastes identified and destroyed over time, or otherwise disposed of, which is the major factor for assessing the effectiveness of this aspect of the Convention.

Recommendation: *Data collection mechanisms for determining how much of specific POPs wastes has been destroyed or otherwise appropriately disposed of, should be improved, in particular through working more closely with the Basel Convention to give more focus to the work on POPs wastes inventories, through the Basel Convention's POPs Technical Guidelines and its national reports which are required to provide details on exports and imports for individual waste streams.*

103. According to estimates, only a limited proportion of known POPs wastes and stockpiles upon becoming wastes, in particular POPs pesticides and PCB, have been eliminated to date.

Recommendation: *Parties need to accelerate their efforts for sound management of POPs stockpiles and wastes, including their further identification, and prepare plans of action that prioritize disposal of waste.*

C. Processes supporting control measures

1. Specific exemptions and notifications of production and use (Article 4)

104. The outcome to be addressed in assessing the effectiveness of Article 4 is whether Parties have transitioned to alternative products and processes within the allowed time period.

(a) Main findings

105. The number of Parties registered for specific exemptions for chemicals in commerce is low. As information transmitted to the Secretariat on the production and use of these chemicals is very limited, it is highly probable that some Parties may be continuing to produce and use the chemicals listed in the Annexes to the Convention without registration for specific exemptions.

106. No extensions of registrations of specific exemptions have been granted to date after the five year exemption period. The lack of any request for extensions of registrations of specific exemptions could be an indicator of less reliance on POPs and of a transition to alternative products and processes within the allowed time period. It is also possible that not all Parties that are in need of such exemptions have notified to the Secretariat to register for those exemptions, thus making a request for an extension unnecessary.

107. Furthermore, it is important to note that several Parties have expressed a continued need for certain specific exemptions and that the Conference of the Parties continues to evaluate the continued need for chemicals for the various acceptable purposes and specific exemptions e.g. DDT; PFOS, its salts and PFOSF; and BDEs.

(b) Conclusions and recommendations

108. Parties must register for specific exemptions at the time they become bound to the Convention and/or its amendments, if such need is identified. The number of Parties registered for specific exemptions for the newly listed POPs in commerce is lower than expected and no extensions of registrations of specific exemptions have been requested to date. Failure to claim an exemption for a listed substance that is being utilized by a Party has the potential to constitute a large gap in the Convention's information base, and represents non-compliance with the Convention.

Recommendation: *Awareness raising activities, such as webinars, immediately after the adoption of an amendment at a COP, should be routinely organized by the Secretariat in order to remind Parties about domestic actions necessary to implement their obligations within one year from the date of communication by the depositary of the amendment to Annexes A or B, including the need to assess whether they need to claim an exemption. Such webinars should include an explanation of why the claiming of exemptions is important to track not only overall effectiveness of the Convention's controls, but also the impact on other Parties' ability to enforce their laws on import of listed chemicals. Improving and even automating some aspects of communication with Parties (i.e. tracking and alert systems) could assist in making exemption reporting more meaningful and successful.*

2. Listing of chemicals in Annexes A, B and C (Article 8)

109. The outcome to be addressed in assessing the effectiveness of Article 8 is whether the review process is capable of identifying new POPs for listing in the annexes to the Convention as recommended by the POPs Review Committee.

110. The successful implementation of this article is necessary to ensure that the Convention remains a living agreement and deals with substances known to have persistent organic pollutant properties. A success parameter is the completion of the review of chemicals and the eventual listing of new POPs.

(a) Main findings

111. The operation of the process laid out in Article 8 for listing chemicals in Annexes A, B and/or C resulted in the listing of 14 additional chemicals in the Stockholm Convention over 11 years.

112. All the chemicals recommended by the POPs Review Committee for listing have been adopted by the Conference of the Parties. Up until the seventh meeting of the Conference of the Parties, all chemicals and related control measures were adopted by consensus. At its seventh meeting, when all efforts at achieving consensus were exhausted, as a last resort, the Conference of the Parties called for a vote for the first time ever on pentachlorophenol and its salts and esters, which, as a result of the vote, was listed under the Convention.

(b) Conclusions and recommendations

113. With the addition of 14 new substances to the list of legacy POPs globally banned or restricted under the Convention at the time it entered into force, the operation of the process for listing new substances in Annexes A, B and/or C can be considered successful. The recommendations for listing are made by the POPs Review Committee based on risk profiles and risk management evaluation documents. Those documents are prepared on the basis of available peer reviewed literature and the information and comments submitted by Parties and observers. There has recently been recognition of the need to seek improvements in the quality, quantity, breadth and timeliness of information submitted by Parties and observers, for consideration by the Committee during its preparation of draft risk profiles and draft risk management evaluations.

Recommendation: *Parties and observers should provide adequate and timely information to the Secretariat for the use of the POPs Review Committee to support it in the development of sound supporting documents and recommendations to the Conference of the Parties on the listing of new substances.*

D. Enhancing understanding

1. Information exchange (Article 9)

114. The outcome to be addressed in assessing the effectiveness of Article 9 is whether Parties have access to the information that they need on POPs and their related issues, and whether that information has helped them to meet their obligations under the Convention.

115. Given the diverse and often informal methods used to disseminate information, it is very difficult to measure the impact of information exchange measures. Obtaining comparable data on outcome indicators or specific activities on a global scale would require a coordinated approach and significant investment. No outcome indicator has therefore been included for this element.

116. Sources of information reviewed for this evaluation include the national focal points and official contact points nomination forms submitted to the Secretariat, the national reports submitted pursuant to Article 15 from either the third, second, first national reports, NIPs, various reports extracted from the Secretariat information systems, and the activity reports submitted by the Stockholm Convention regional centers.

(a) Main findings

117. Progress has been achieved through the ongoing work on a clearing-house mechanism for the Basel, Rotterdam and Stockholm conventions. As of 2015, new information systems have been developed including a joint calendar, joint contact and expert database, joint scientific and technical publications, webinar library and online reporting serving the three conventions, resulting in significant enhancements to the conventions' websites and knowledge management capacity.

118. Most Parties have established information exchange processes with the Secretariat and nominated national focal points. As a result, a majority of Parties and regional centers are actively contributing to the clearing-house mechanism by submitting information to the Secretariat. This information is then accessed by a fair number of stakeholders through the clearing-house mechanism.

119. A majority of Parties are also engaged in information exchange activities with the regional centers. However, the nature, scope, quality, reach and impact of those information exchange activities are not specified and therefore a full analysis of the extent to which the objectives of the Convention are being met, is not possible.

(b) Conclusions and recommendations

120. The provisions of Article 9, particularly nomination of national focal points and the establishment of the clearing-house mechanism, have contributed to increased information exchange and awareness on POPs issues globally. A majority of stakeholders are actively contributing to the clearing-house mechanism.

Recommendation: *Parties should continue to exchange information through the clearinghouse mechanism. User surveys on the content, quality and impact of information exchange activities could be performed. Such surveys should be conducted in a cost efficient way e.g. through online questionnaires.*

2. Public information, awareness and education (Article 10)

121. The outcomes to be addressed in assessing the effectiveness of Article 10 are the extent to which the public and stakeholders are informed by access to information on the effects of POPs and their sound management and alternatives, and whether public awareness on issues related to POPs, as well as understanding of the Convention, its procedures and achievements has improved.

122. Public awareness is an important factor for the effective implementation of the Convention. Obtaining comparable data on outcome indicators or specific activities on a global scale would, however, require a coordinated approach and significant investment. No outcome indicator has therefore been included for this element.

(a) Main findings

123. There has been an increase in the number of Parties having taken measures regarding public information, awareness and education. While some Parties had taken such measures before the Convention was adopted in 2001, more Parties, particularly those that are developing country Parties and Parties with economies in transition, have adopted such measures post entry into force of the Convention.

(b) Conclusions and recommendations

124. The Convention has clearly triggered action by Parties on public information, awareness and education. Through such initiatives spreading widely at the global level, such as the Chemical Information Exchange Network, awareness on the issue of POPs has increased over time, as also demonstrated by measurements showing decreasing trends of concentrations of POPs in the environment and in humans.

Recommendation: *Parties should continue to implement activities targeted at increasing public information, awareness and education on POPs, including as new POPs are being listed in accordance with Article 8. More focus on the activities directed towards public and educational institutions should be encouraged and monitored.*

3. Research, development and monitoring (Article 11)

125. The outcome to be addressed in assessing the effectiveness of Article 11 is whether Parties have undertaken research, development, monitoring and cooperation pertaining to POPs, chemicals proposed for listing and alternatives, and whether those activities have assisted Parties to better fulfil their obligations under the Convention.

126. An indicator for this element could be the number of initiatives by Parties to implement Article 11, including research, development, including best practices and techniques, or monitoring of environment and health. It is recognized that monitoring and assessment activities contributing to the global monitoring plan are relevant to the implementation of this article and that the regional and global monitoring reports do provide information that is relevant to the evaluation. Given the difficulty of accurately assessing the effect of the information produced by various initiatives in contributing to the Parties' fulfilment of their obligations, no outcome indicator has been included for this question.

(a) Main findings

127. Research and development initiatives on POPs have clearly been triggered worldwide by the Convention. A significant increase in the number of scientific articles on the topic can be observed over the last three decades further to the adoption of two major treaties to protect human health and the environment from these chemicals: the Aarhus Protocol on POPs under the CLRTAP and the Stockholm Convention.

128. In the case of developing country Parties, capacity building activities conducted in the frame of the global monitoring plan enabled activities related to the identification of the presence, levels and trends in humans and the environment and environmental transport, fate and transformation. Through providing inventory guidance, the Convention also worked towards global identification of sources and releases of POPs into the environment.

(b) Conclusions and recommendations

129. Since its entry into force, the Stockholm Convention has, without any doubt, acted as a catalyst for POPs research, monitoring and modelling activities worldwide. The Convention has also been successful in bringing together research findings from around the world, and enhanced awareness and knowledge about POPs. Capacity building activities have been mobilized to enable Parties to conduct research and monitoring on POPs and therefore enable effective participation of developing country Parties, including at the regional level, in the process for effectiveness evaluation. There is a need for sustained capacity building activities to strengthen national scientific and technical research capabilities in developing country Parties.

Recommendation: *Research, monitoring, modelling, risk evaluation and data sharing should be sustained in the long term, and even enhanced in developing country Parties, including at the regional level, to advance national and regional capacities. Capacity building activities to strengthen national scientific and technical research capabilities in developing country Parties should be sustained.*

E. Support for implementation

1. Technical assistance and financial resources (Articles 12–14)

130. The outcomes to be addressed in assessing the effectiveness of Articles 12–14 relate to: the provision of timely and appropriate technical assistance and technology transfer; the adequacy of financial resources to meet the incremental costs of implementing obligations under the Convention; and, the effectiveness of regional centres in facilitating capacity building, technical assistance and technology transfer in the regions.

131. Fourteen indicators have been identified for these outcomes. Many of the indicators are helpful in assessing these outcomes, but it should be noted that the work undertaken in the context of the review of the financial mechanism under paragraph 8 of Article 13 could inform these indicators or vice versa. Relevant information for effectiveness evaluation is contained in the reports of reviews of the financial mechanism; in particular, the third review has been taken into account.[18]

(a) Technical assistance (Article 12): Main findings

132. The number of Parties having reported providing technical assistance pursuant to Article 12 of the Convention stayed relatively constant over the period 2008-2015; a certain decrease was observed between 2011 and 2014. On the other hand, the information derived from the implementation of GEF projects does not point to a decrease in technical assistance.

133. From the number of GEF projects, including a technical assistance or technology transfer component, and the data derived from the technical assistance activities of the Secretariat, it is apparent that technical assistance and technology transfer continues to be a key priority of developing country Parties and Parties with economies in transition.

134. Sixteen regional centres have been established and have been active to varying degrees in the provision of technical assistance and technology transfer within their regions. The 2015 evaluation of their performance and sustainability points to only a few centres needing further support to reach expected standards.

[18] UNEP/POPS/COP.6/23; UNEP/POPS/COP.6/INF/25.

(b) Technical assistance (Article 12): Conclusions and recommendations

135. The information provided by Parties on technical assistance and technology transfer is limited; it does not match the numbers of trained persons listed in Secretariat reports on technical assistance activities, nor through surveys relating to technical assistance requests, nor when GEF projects are included in the assessment. The number of activities linked to technology transfer and technical assistance, in particular through regional centres, is likely even higher.

Recommendation: *There is a need to strengthen the gathering of information through national reports under Article 15, on the provision of technical assistance and technology transfer through the Secretariat's technical assistance programme, GEF projects and other sources. This could also include information on how these activities impacted Parties' capacities to fulfil their obligations under the Stockholm Convention.*

136. Capacity building and technical assistance in developing country Parties and Parties with economies in transition will continue to be a priority, in particular for the development and/or strengthening and enforcing of national legislation and/or regulations implementing the Convention, to introduce safer and affordable alternatives to the POPs still on the market, to identify and manage POPs stockpiles and wastes, and, as appropriate, contaminated sites. Regional delivery, including through Stockholm Convention regional and subregional centres, are key to further the efforts in the above fields.

137. At its seventh meeting, the Conference of the Parties evaluated, in accordance with its approved criteria, the performance and sustainability of the Stockholm regional and subregional centres and called for sustained efforts to enhance their performance and actions in supporting developing country Parties. The Conference endorsed all 16 Stockholm regional and subregional centres for another four years. The report on the next evaluation of the centres will be considered at the ninth meeting of the Conference of the Parties in 2019. Some centres still face challenges and will be enhanced if Parties, as well as other regional centres in a position to do so, cooperate and support those regional centres through the exchange of best practices, the provision of technical assistance and the promotion of technology transfer. Sustainable financial and technical resources are necessary for the centres to succeed in their work under the Convention.

Recommendation: *There is a need to strengthen technical assistance and technology transfer activities, including through regional delivery and effective and efficient cooperation with the regional centres. The aim should be an efficient and effective network of centres through greater institutional coordination and the promotion of the exchange of information, lessons learned and cooperation among them on areas of expertise in which they provide assistance, through regular communication, including meetings of the centres and increased use of other means of communication.*

Technical assistance activities, highlighted throughout this report, include the following priority areas:

(a) Identifying, collecting and sharing information on POPs, in particular those still in use and those newly listed, including through existing programmes and processes;

(b) Strengthening data collection mechanisms and methods for establishing and maintaining reliable inventories (also contributing to reporting);

(c) Developing and strengthening legislation and/or regulations to implement the Convention to manage the chemicals throughout their lifecycles;

(d) Strengthening technical assistance to implement best available techniques and best environment practices;

(e) Introducing guidance and methodologies for phasing in safer and affordable alternatives;

(f) Identifying and managing stockpiles and wastes and, as appropriate, contaminated sites.

(c) Financial resources (Articles 13 and 14): Main findings

138. From 2002 to 2018, programming targets for the third, fourth, fifth and sixth replenishment of the GEF Trust Fund amounted to USD 1,300,000,000. As at 6 October 2016, recipient countries of the GEF have received a total of USD 857,844,838 in GEF resources committed to POPs projects. All 149 recipient countries that have requested financial resources from the GEF within this period, have received financial resources from its Trust Fund.

139. The third review of the financial mechanism conducted in 2013, points to responsiveness to growing needs for funding for POPs by increased allocated resources, although there is still a gap

between funding provided for POPs activities through the GEF and the funding identified by Parties as needed to fulfil Convention obligations. The above review encouraged the Conference of the Parties to improve its process of assessing the funding needed by developing country Parties and Parties with economies in transition to implement the Convention. Country priorities were generally perceived as adequately reflected in projects funded by the GEF, and Parties were felt to be adequately involved in the project development and design process. The above review found that the GEF has been fully responsive in terms of providing information on project approvals and resources committed, including co-financing data. It stated that almost USD 1.5 billion have been committed to POPs projects through co-financing sources and that co-financing has increased from USD 1.97 per dollar of GEF grant in the second review period, up to USD 4.02 per dollar of GEF grant in this review period. The review concluded that this trend reflected the shift in the POPs portfolio from planning (i.e., NIPs) to implementation.

140. From 2000 to 2008, the USD 20-million Canada POPs Fund was established to assist developing country Parties and Parties with economies in transition in dealing with POPs and in taking initial actions to prepare for implementing the Convention.

141. From 2004 to 2015, contributions to the Stockholm Convention general trust fund (SCL) amounted to USD 40,880,843. In the same period, contributions to the Stockholm Convention voluntary special trust fund (SVL) amounted to USD 22,332,052. Contributions to SVL have seen an increase in the current and last biennium compared to the levels provided in 2006 and 2007. Projections for the biennium 2016/2017 suggest a decline in the voluntary funding, which is mainly due to the changing funding priorities within and outside of the chemicals and waste cluster.

(d) Financial resources (Articles 13 and 14): Conclusions and recommendations

142. For the effectiveness evaluation of Articles 13 and14, indicators may need to address what are the eligible needs, how much funding is available to meet the needs, and how funding is being disbursed. Evaluations conducted by other entities such as the evaluation of projects by the GEF or by the regional centres, the reviews of the financial mechanism and of the regional centres, and information regarding the integrated approach for financing of chemicals all help inform the effectiveness evaluation in a reliable and cost effective manner. With new chemicals being added to the Convention every two years and several implementation challenges for the POPs already listed, there is a need to increase funding to support implementation of new obligations under the Convention. A gap still appears to exist between funding provided through the GEF and the funding needed by developing country Parties and Parties with economies in transition to enable them to meet the agreed full incremental costs of implementing measures which fulfil their obligations under the Convention.

Recommendation: *The financial mechanism of the Convention, including the GEF in its capacity as principal entity entrusted, on an interim basis, with the operations of the mechanism, and other donors, should consider ways to provide additional sustainable financial resources to continue to support and enhance the implementation of the Convention by developing country Parties and Parties with economies in transition, over the long term.*

The entities entrusted with the financial mechanism should continue to consider in their programming of areas of work the following priority areas, as highlighted throughout this report:

(a) The development and deployment of products, methods and strategies as alternatives to POPs;

(b) The restriction of DDT production and/or use for disease vector control in accordance with WHO recommendations and guidelines on the use of DDT and when locally safe, effective and affordable alternatives are not available to the Party in question;

(c) The elimination of the use of PCB in equipment by 2025;

(d) The environmentally sound waste management of liquids containing PCB and equipment contaminated with PCB, having a PCB content above 0.005 per cent, in accordance with paragraph 1 of Article 6 and part II of Annex A to the Convention, as soon as possible and no later than 2028;

(e) The introduction and use of best available techniques and best environmental practices to minimize and ultimately eliminate releases of unintentionally produced POPs;

(f) The development and/or strengthening of national legislation and/or regulations to specifically implement obligations regarding POPs listed under the Convention;

(g) The review and update of NIPs, including, as appropriate, their initial development.

F. Measuring success

1. Implementation plans (Article 7)

143. The outcome to be addressed in assessing the effectiveness of Article 7 is whether the establishment of NIPs has resulted in full implementation of the Convention. The individual NIPs are available on the Convention's website at: http://chm.pops.int/Implementation/NIPs/NIPTransmission/tabid/253/Default.aspx

144. Several guidance and draft guidance documents have been prepared for assisting Parties with the development and updating of NIPs.

(a) Main findings

145. As of April 2016, twelve years after the entry into force of the Convention, a majority of Parties (91%) have transmitted their NIPs addressing the 12 initial POPs. Based on regular monitoring of NIP transmission dates, the initial high rates with which the NIPs were transmitted have slowed down over time. For most Parties, the deadline to transmit the updated NIPs addressing amendments adopted at the fourth and fifth meetings of the Conference of the Parties has passed. Only 38 Parties have transmitted their updated NIPs addressing amendments adopted at the fourth meeting of the Conference of the Parties (i.e. 23% of Parties under the obligation to do so). Only 32 have transmitted their NIPs addressing amendments adopted at the fifth meeting of the Conference of the Parties (i.e. 20% Parties which are under the obligation to do so).

(b) Conclusions and recommendations

146. A large majority of Parties (91%) have transmitted their NIPs addressing the 12 initial POPs; for developing country Parties this was supported by funding provided by the GEF, co-financed by the Parties. The NIP development process has helped Parties to establish a network of national stakeholders, conduct an analysis of the baseline situation, including inventories, and identify national priorities with regards to the management of POPs, as well as consider measures to implement obligations pursuant to the Convention. In addition, the NIP is an important tool for raising awareness and providing information to the public, as well as for communication with donors to raise funds to implement strategies and action plans identified in the NIP.

Recommendation: *The process for review and updating the NIPs in developing country Parties and Parties with economies in transition should continue to be funded with priority by the financial mechanism of the Convention, including the GEF in its capacity as principal entity entrusted, on an interim basis, with the operations of the mechanism.*

147. Article 15 reports are a tool to report on progress in implementing the NIPs. While ensuring flexibility for countries to prepare their NIPs, electronic templates could be developed for certain parts of the implementation plans containing quantitative information, such as action plans and inventories, harmonized with the reporting under Article 15. This would allow better and more reliable analysis of the data, as well as the identification of trends and emerging needs. It would also enable Parties to expedite the review and/or update of their NIPs.

148. Parties seem to be having difficulties in revising and updating their NIPs to address the newly listed POPs. In particular, many countries seem to be facing challenges in identifying these newly listed POPs in products and articles.

Recommendation: *All Parties should enhance their efforts to update NIPs. Developed country Parties could contribute by supporting activities such as face-to-face training and targeted NIP-development technical assistance. The development of an electronic template for quantitative information contained in the NIPs, harmonized with the reporting under Article 15, would support Parties in meeting their obligations to prepare, review and/or update their NIPs.*

2. Reporting (Article 15)

149. The outcome to be addressed in assessing the effectiveness of Article 15 is whether the Conference of the Parties has the necessary information to assess whether Parties are implementing the Convention.

150. Reporting under Article 15 was a major source of information for the effectiveness evaluation as it provides Parties' data on their implementation of the Convention. If an insufficient number of Parties report on time, or if insufficient information is included in the national reports, both the effectiveness evaluation and compliance assessment will be impeded.

(a) Main findings

151. Only a small proportion of the Parties provided their reports as required under Article 15. Between the three national reports required to date, 110 Parties (61%) have reported and 70 Parties (39%) have never reported. Overall, only 40% of the Parties reported in the third cycle as compared with 55% in the second and 31% in the first. The decrease in the number of reports submitted by Parties between the 2nd and the 3rd cycle can be explained, among other challenges, by the difficulties in accessing and using the new electronic reporting system.

152. The majority of the Parties that submitted national reports (64-95%) have successfully completed their NIPs.

153. The majority of Parties had difficulties in providing complete national reports and/or provided data that was clearly erroneous or inconsistent.

154. The format of the national reports has been revised taking into consideration the framework for the effectiveness evaluation and considering the information requirements pursuant to the Convention to serve the needs of the Conference of the Parties for the purposes of Article 16; both the framework and the revised reporting format have been adopted in 2013, by decisions SC-6/22 and SC-6/21, respectively.

(b) Conclusions and recommendations

155. Reporting under Article 15 is supposed to constitute a major source of information to assess whether Parties are implementing the Convention. This serves the dual purposes of compliance assessment under Article 17 and effectiveness evaluation under Article 16 of the Convention. The timeliness, completeness and quality of the national reports submitted by Parties are also essential to support the evaluation and compliance process. The present evaluation was hampered by the limited available data from national reports. This will continue to hamper future evaluations until the situation is substantially improved. Some of the information that would have been helpful in conducting this evaluation was not part of the current reporting format, such as information on the extent to which the Convention is being implemented through legal or administrative measures and which of these measures are enforced, and data on POPs use.

Recommendation: *The Secretariat should develop and present its refined strategy to enhance reporting, taking into account the comments made in this report, to assist Parties in providing data and information that are useful for compliance assessment and the effectiveness evaluation and to enable them to establish a QA/QC process for reported data. Furthermore, there is an urgent need for validation of reported data with the reporting Party, as part of the final reporting process.*

156. There is a range of potential avenues to be explored for improving reporting rates and communication with Parties, e.g., identifying focal points, and their alternates and communicating upcoming deadlines and available resources to assist with reporting. Compliance mechanisms under other multilateral environmental agreements have proven to be successful in addressing reporting requirements, as were technical and financial support provided to Parties for the preparation of the report, and the availability of dedicated staff in countries tasked to prepare and submit the reports. The Special Programme can act as an additional funding mechanism for supporting chemicals management under the Conventions for institutional strengthening, including improving national reporting. The role of the regional centres in assisting and training countries in this area could be strengthened and regional coordination improved.

Recommendation: *Once the Conference of the Parties has approved a compliance mechanism under Article 17, a priority focus of the compliance work programme should address the issue of improving reporting.*

3. Non-compliance (Article 17)

157. At the time of the writing of this report, the Conference of the Parties has not approved procedures and institutional mechanism for determining non-compliance with the provisions of the Convention and for the treatment of Parties found to be in non-compliance. Accordingly, there is no information currently available on non-compliance provided through these procedures which are to be adopted, as per Article 17, “as soon as practicable”.

(a) Main findings

158. The lack of a compliance mechanism impacts the Convention's operations in a number of ways. First, there is no accurate assessment of implementation levels although evidence based on the lack of reporting suggests that it is no higher than 40%. Second, this has left a key gap in implementation and compliance as well as in information for the effectiveness evaluation. Work in compliance committees in other multilateral environmental agreements has successfully contributed to increasing the reporting rates. In the case of the Stockholm Convention, lacking a committee of Parties, the Secretariat was instead tasked to develop and refine a strategy to improve reporting rates. The absence of an established compliance mechanism has resulted in large gaps in information on whether Parties are meeting their obligations under the Convention. Such information is crucial in determining whether the Convention is effective in meeting its objective, as it would provide information for determining non-compliance with its provisions. If all Parties move towards full compliance, and there remain significant levels of listed POPs in the environment, then this could suggest that current Convention controls do not sufficiently address the problem of POPs.

159. Compliance mechanisms have been useful in improving the implementation and effectiveness of many other conventions, as evidenced for instance under the Basel Convention where the Implementation and Compliance Committee has addressed systemic implementation and compliance issues affecting many Parties, as well as providing advice and assistance to individual Parties facing implementation and compliance difficulties.

160. The Convention cannot be considered fully implemented at the international level without Article 17 procedures and mechanisms in place. In fact, this is the only aspect of the Convention that has not yet been implemented by the Conference of the Parties. In line with decision SC-7/26, the Conference of the Parties will consider further at its eighth meeting the adoption of the procedures and mechanisms on compliance required under Article 17, on the basis of the draft texts annexed to that decision.

(b) Conclusions and recommendations

161. A compliance mechanism is urgently needed for the Stockholm Convention in order to support core transparency and accountability functions under the Convention as well as support the Conference of the Parties in assessing whether the Convention is effective in achieving the objective agreed to in Article 1. As in other multilateral environmental agreements, such a mechanism would provide the Conference of the Parties with a subsidiary body that could identify systemic issues of non-compliance affecting many Parties, and could assist individual Parties to address compliance challenges.

Recommendation: *A compliance mechanism should be established at the eighth meeting of the Conference of the Parties so that it can begin generating compliance information to serve the next effectiveness evaluation and provide the implementation and compliance services that will benefit Parties.*

4. Effectiveness evaluation (Article 16)

162. The outcome to be addressed in assessing the effectiveness of Article 16 is whether the effectiveness evaluation is providing useful analysis on the extent to which the Convention is achieving its objective of protecting human health and the environment from POPs; how well specific measures are contributing to achieving this objective; and identification of ways to improve the effectiveness of the Convention.

163. An assessment of the quality and quantity of the available data can help to identify areas for improvement that would strengthen future evaluations. The shortage of reporting data and the absence of compliance information will limit the ability of the effectiveness evaluation to provide useful analysis. Reviewing the uptake of recommendations made in a previous evaluation can help to assess whether the evaluation has proved useful.

(a) Main findings

164. A number of processes are in place to support the first cycle of the effectiveness evaluation, while others are still needed, or need improvement. The global monitoring plan is an example of successful implementation of the provisions of Article 16, providing useful data on the presence of POPs in the environment and in humans. While national reports under Article 15 have been collected since 2006, the reported information is very limited for effectiveness evaluation. Procedures and institutional mechanism for determining non-compliance are not yet in place and compliance information is therefore not available for this evaluation.

165. Besides POPs monitoring data, the global monitoring programme has also generated positive outcomes in several other areas of implementation of the Convention through enhanced knowledge and increased scientific competence and awareness. This indicates that the science based integrated approach of the Convention is working well. Because of the lack of information from national reports and the lack of compliance procedures and mechanisms; however, it is difficult to fully evaluate the progress being made under the Convention in achieving its objective.

(b) Conclusions and recommendations

166. The global monitoring plan provides the necessary environmental monitoring information to fully support the evaluation of the effectiveness of the Convention.

Recommendation: *The global monitoring plan should be sustained in the long term to enable it to continue to provide valuable data for effectiveness evaluation. See also recommendation in paragraph 31 above (Section II.A.1. Protecting human health and the environment - Article 1).*

167. Reporting under Article 15 is a major source of information for effectiveness evaluation under Article 16; however, current reporting under Article 15 is insufficient. The present evaluation was severely restricted by the limited available data from national reports.

Recommendation: *Effective strategies should be put in place by the Conference of the Parties to improve reporting rates and provide critical information and data for the effectiveness evaluation. See also recommendation in paragraph 155 above (Section II.F.2. Reporting - Article 15).*

168. The lack of a compliance mechanism impacts the Convention's operations in a number of ways, most notably by leaving a key gap in information for the effectiveness evaluation.

Recommendation: *Procedures and institutional mechanisms for compliance should be established urgently in order to generate compliance information to serve the next effectiveness evaluation. See also recommendation in paragraph 161 above (Section II.F.3. Non-compliance - Article 17).*

169. The adopted procedure for effectiveness evaluation provided a good basis for conducting the first evaluation cycle. Based on the experience from the present evaluation, the framework can be improved and streamlined for future evaluations. Recommendations for amendments to the framework are provided in a separate report.[19]

Recommendation: *The framework for effectiveness evaluation should be amended in accordance with the recommendations of the effectiveness evaluation committee.*[20]

G. General and cross-cutting issues

170. The evaluation also considers more general or cross-cutting questions of effectiveness, which do not relate to specific Articles, but to the effectiveness of the Convention as a whole, e.g., roles of Parties and non-Parties, overall governance of Convention obligations, issues with POPs in products, and identification and evaluation of alternatives.

1. Parties and non-Parties

(a) Main findings

171. With regards to the obligations described in this report related to paragraph 2 of Article 3 on exports of chemicals listed in Annex A or B, the term "non-Party" includes Parties that have not agreed to be bound by the amendments to the Convention with respect to a particular chemical. For all other purposes throughout the report, the term "non-Party" shall be understood to refer to States and/or regional economic integration organizations that have not agreed to be bound by the Convention overall.

172. As at 30 April 2016, the amendments to Annexes A, B and C to the Convention adopted in 2009, 2011 and 2013 have entered into force for 93%, 92% and 89% of the Parties to the Convention respectively, while those amendments have not yet entered into force for 13, 14 and 19 Parties to the Convention respectively. Those Parties to the Convention which are not yet bound by the amendments are considered 'non-Parties' with regard to the particular chemical. Since non-Parties do not have to report on these chemicals, no information is available. No additional information is available to further assess non-Party states' potential current production, uses, imports, exports and/or emissions of POPs.

[19] UNEP/POPS/COP.8/INF/41.

[20] Ibid.

173. From the Parties that reported export of POPs for permitted uses, two reported such export to a destination country that was not a Party to the Convention.[21] From the Parties that reported imports, seven reported such import from a country of origin that was not a Party to the Convention.[22] To date, only one certification of non-Party imports had been transmitted to the Secretariat by a Party pursuant to paragraph 2 (b) of Article 3.[23]

(b) Conclusions and recommendations

174. Only one certification of non-Party imports had been transmitted to date to the Secretariat by a Party pursuant to paragraph 2 (b) of Article 3. Parties exporting POPs to non-Parties need to provide more information, including the submission of a certification pursuant to paragraph 2 (b) of Article 3.

Recommendation: *There is a need to encourage non-Parties in their efforts to ratify the Convention and/or the amendments to Annexes A, B and C, in particular those producing newly listed POPs. Parties exporting to non-Parties should be reminded of the obligation to obtain an annual certification from the non-Parties and to transmit such certifications to the secretariat.*

2. Governance

(a) Main findings

175. Since its entry into force, the Convention has triggered changes in countries' attitudes and general practices toward environmentally sound management of hazardous chemicals, in particular POPs. Institutional settings built under the Convention have the potential to impact other chemicals in a way that countries are using chemicals, not just POPs, in a better informed environment and with more precaution. Decreasing trends in POPs concentrations measured in countries which adopted measures preceding the adoption of the Convention are proving that those regulatory actions have the desired impact.

176. As a general note, the procedures and requirements set out by the Convention evolve over time through the various decisions adopted by the Conference of the Parties, for instance through decisions adopted to amend the annexes to the Convention to list new chemicals or to update any necessary procedures taking into account the periodic review and evaluation conducted by the Conference of the Parties.

177. The synergies arrangements have been put in place in order to improve governance and implementation of the Basel, Rotterdam and Stockholm conventions. Although this process is not directly linked to the Stockholm Convention obligations, implementation of the synergies process has the potential to influence the effectiveness of the Convention.

178. The synergies process aims to strengthen implementation of the Basel, Rotterdam and Stockholm conventions at the national, regional and global levels, promoting coherent policy guidance, enhancing efficiency in the provision of support to Parties with a view to reducing their administrative burden and maximizing the effective and efficient use of resources at all levels.

179. Expert processes to develop and/or update guidance to support Parties in meeting the obligations under the Convention have been put in place through extensive expert consultations and involvement of Parties and other stakeholders. The Convention has established mechanisms and processes, through the various expert groups, to continue to develop and/or update guidance to address new developments under the Convention, such as listing of new substances in Annexes A, B and/or C, and support Parties in implementing new obligations. All mechanisms and institutions required under the treaty have been put in place to date except for procedures and mechanisms on compliance pursuant to Article 17.

180. This report has identified a number of areas where Parties' implementation of the Convention is significantly lacking and regular follow-up is needed in order to improve the situation which are: ongoing monitoring of elimination of PCB; accuracy of exemption registrations; development and updating of national implementing legislation; update of the NIPs including Article 5 action plans; and review of national reports and reporting rates. The only subsidiary body established pursuant to the

[21] The non-Party States, which were reported as destination countries with regard to export of persistent organic pollutants for permitted uses, were the United States of America and Malaysia in relation to PFOS, its salts and PFOSF.

[22] The non-Party States, which were reported as countries of origin with regard to import of persistent organic pollutants for permitted uses, were the United States of America, Israel and Italy. The chemicals subject to most recent imports were PFOS, its salts and PFOSF and endosulfan.

[23] UNEP/POPS/COP.7/10.

Convention, the POPs Review Committee, addresses a range of specific technical issues, although other expert groups and processes are established as needed. Currently there is no body mandated to address implementation issues of a technical and policy nature.

181. The example of the Basel Convention open-ended working group (OEWG), which reviews progress on many issues destined for a Conference of the Parties and provides guidance to a wide range of intersessional activities involving Parties, observers and the Secretariat, could be an option for an approach to increase consensus at the meetings of the Conference of the Parties and improve the implementation of the Convention between the meetings. The OEWG format works by tackling the issues in a reduced intersessional body that is similar to the Conference of the Parties, including consideration of both policy and technical issues towards the further development and implementation of the Convention. In addition to the OEWG, the Implementation and Compliance Committee is entrusted to review general issues of implementation (and compliance) identified by the Conference. This includes monitoring of implementation, identification of implementation difficulties as well as the development of guidance or recommendations to the Conference on how to improve implementation. Other similar models, such as subsidiary bodies on implementation used under the United Nations Framework Convention on Climate Change and the Convention on Biodiversity are also possibilities, whereas intersessional work under the Stockholm Convention is restricted to technical listing issues.

(b) Conclusions and recommendations

182. Increasing synergies in the implementation of the Basel, Rotterdam and Stockholm conventions has the potential to strengthen effectiveness of the Stockholm Convention.

Recommendation: *The recommendations from the review of the synergies arrangements as approved at the eighth meeting of the Conference of the Parties should be factored in, as relevant, into future effectiveness evaluations.*

183. Although the information base for this evaluation has been limited, it does appear that the Convention provides an appropriate and adequate framework for addressing the production, use, releases, import, export, and disposal of POPs. However, inadequate implementation is the key issue that has been identified in this evaluation and no subsidiary body exists to monitor or improve implementation.

Recommendation: *Implementation of the Convention needs to be closely monitored and improved during the intersessional period between meetings of the Conference of the Parties.*

3. POPs in products

(a) Main findings

184. A major cross-cutting issue is that of POPs in products, which adds uncertainty as to the movement of chemicals across borders. There is a need to know more about products, their movements and associated releases. PFOS and HBCD have been listed in Annex A to the Stockholm Convention, including reference to labelling as an obligation that assists with the issue of identifying chemicals in products. Also related, draft guidance on labelling and guidance on monitoring and screening the newly listed POPs in products has been developed under the Stockholm Convention. While the guidance on monitoring and screening of the newly listed POPs in products and draft guidance on labelling has been developed under the Convention, this is an issue that merits more focused attention. Useful collaboration on chemicals in products with other relevant international activities, such as the Strategic Approach to International Chemicals Management, is also ongoing.

(b) Conclusions and recommendations

185. For some chemicals, labelling has been included as an obligation to assist with the issue of products, and draft guidance has been developed on labelling and on monitoring and screening of POPs in products. However, uncertainty as to the movement of POPs contained in products that cross borders remains high. Useful collaboration on chemicals in products with other relevant international activities is ongoing.

Recommendation: *There is a need for more information about POPs contained in products, their movements and associated releases, ideally during the information-gathering stages of the review process of the POPs Review Committee. The POPs Review Committee would then be better able to consider labelling when making recommendations for control measures. The draft guidance on labelling for the newly listed POPs should be completed. Collaboration on chemicals in products with other relevant international activities should be maintained as appropriate.*

4. Alternatives

(a) Main findings

186. The work on safe alternatives to listed POPs is important particularly in view of the need for improving the quality of risk assessment of alternatives. Challenges have been identified with the alternatives in use as flame retardants. Concentrations of old flame retardants such as organophosphates used as alternatives to BDEs or HBCD are increasing in the environment. They are not technical mixtures like BDEs, which could be monitored as a group, but rather individual chemicals that need to be dealt with individually, adding burden to the associated risk assessment costs.

187. The Convention is intended to address alternatives initially through the socio-economic considerations pursuant to Annex F regarding a chemical nominated for listing. After listing, further work on alternatives may be conducted such as with the example of the work programme on BDEs and PFOS. By listing substances and identifying alternatives for assessment and screening against Annex D, many industries would consider getting out of the production of chemicals that later would be proposed for listing, in particular noting the high costs for research and development. Nevertheless, the issue of using chemicals already available on the market as alternatives to BDEs and HBCD remains important, as they can be produced at a fraction of the cost.

188. A stronger call for work on alternatives could be made, such as through Article 11, to stimulate further research and information sharing through relevant channels such as the clearing-house mechanism or through the regional and global organization groups under the global monitoring plan. Ultimately, the success of the Convention in the future could be seen through the provisions of paragraph 3 of Article 3, as there would be no longer the need for listing new substances as they would be no longer produced. The consideration of alternatives should also take into account the current status of substances listed under other conventions and international agreements which consider POPs, green-house gases, ozone depleting substances, endocrine disrupting substances, etc.

(b) Conclusions and recommendations

189. The Convention addresses alternatives through the considerations pursuant to Annex F. Additional work on safe chemical and non-chemical alternatives for specific chemicals which are listed in the Convention or being considered for listing may be conducted such as with the example of the work programme on BDEs and PFOS. By listing substances and identifying alternatives for assessment and screening against Annex D, many industries would consider getting out of the production of chemicals that later would be proposed for listing, in particular due to the high costs for research and development.

Recommendation: *A stronger call for work on alternatives could be made through Article 11 to stimulate further research and information sharing through relevant channels such as the clearing-house mechanism or through the regional and global organization groups under the global monitoring plan, with the ultimate goal of eliminating the need for listing new substances as they would be then no longer produced*

List of abbreviations

AMAP	Arctic Monitoring and Assessment Programme
BAT	Best Available Techniques
BEP	Best Environmental Practices
CEE	Central and Eastern Europe
CITES	Conference on International Trade in Endangered Species
CLRTAP	Convention on Long-range Transboundary Air Pollution
COP	Conference of the Parties (to a Convention)
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
FAO	Food and Agriculture Organisation of the United Nations
GEF	Global Environment Fund
GMP	Global Monitoring Plan
GRULAC	Group of Latin American and Caribbean Countries
HBCD	Hexabromocyclododecane
HCH	Hexachlorocyclohexane
IVM	Integrated Vector Management
LOD	Limit of detection
LOQ	Limit of quantification
MEAs	Multilateral Environmental Agreements
NIPs	National Implementatuion Plans
OCPs	Organochlorine pesticides
PBDEs	Polybrominated diphenyl ethers
PCB	Polychlorinated biphenyls
PCDD	Polychlorinated dibenzo-*para*-dioxins
PCDF	Polychlorinated dibenzofurans
PFOS	Perfluorooctane sulfonic acid
PFOSF	Perfluorooctane sulfonyl fluoride
POPs	Persistent organic pollutants
POPRC	POPs Review Committee
PRTRs	Pollutant release and transfer registers
QA/QC	Quality assurance and quality control regimes
ROGs	Regional organization groups for the Global Monitoring Plan
SAICM	Strategic Approach to International Chemicals Management
SCRC	Stockholm Convention Regional Centres
TEQ	Toxicity equivalents
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
WEOG	Western Europe and Others Group
WHO	World Health Organization

I. Introduction

190. The objective of the Stockholm Convention is to protect human health and the environment from persistent organic pollutants. The Convention was adopted on 22 May 2001 in Stockholm, Sweden, and entered into force on 17 May 2004, 90 days after the date of deposit of the fiftieth instrument of ratification, acceptance, approval or accession.

191. The Convention requires parties to adopt and implement measures aimed at reducing or eliminating the release of persistent organic pollutants into the environment with a view to protecting human health and the environment from those substances. Where the obligations allow for flexibility, the measures adopted by parties may vary to some degree, reflecting their differing situations. It is expected, however, that in combination they will reduce and/or eliminate overall releases with consequent benefits for human health and the environment across the globe.

192. Paragraph 1 of Article 16 of the Convention states that, commencing four years after the date of entry into force of the Convention, and periodically thereafter at intervals to be decided by the Conference of the Parties, the Conference shall evaluate the effectiveness of the Convention. Paragraph 3 of Article 16 states that the evaluation shall be conducted on the basis of available scientific, environmental, technical and economic information.

193. As the Convention's impact will be the result of individual and collaborative measures by parties, any evaluation of that impact must as a practical matter include an assessment of whether the combination of measures adopted by parties provides, at the aggregate level, a timely improvement in the situation prevailing before the Convention entered into force.

194. The first effectiveness evaluation was completed in May 2009 at the fourth meeting of the Conference of the Parties[24]. However, it was noted that the procedures for the evaluation stage of the effectiveness evaluation were not defined at that time, and an ad hoc working group was established to develop possible procedures for this purpose[25].

195. At its sixth meeting in May 2013, the Conference of the Parties adopted the framework for effectiveness evaluation along with the terms of reference of an effectiveness evaluation committee with the mandate to undertake the evaluation, draw conclusions and make recommendations on its basis[26].

196. The effectiveness evaluation committee was established by the Conference of the Parties at its seventh meeting to serve until the close of its eighth meeting. The first six-year evaluation cycle takes place between 2010 and 2017.

A. Purpose of this report

197. The purpose of the effectiveness evaluation report is to assess, in accordance with the framework for effectiveness evaluation, whether the Convention has succeeded in achieving its objective of protecting human health and the environment from persistent organic pollutants; to determine more specifically the effectiveness of the specific measures provided in the Convention to achieve this objective; and to identify ways to improve the effectiveness of the Convention.

198. The Conference of the Parties also tasked the Committee with evaluating the framework itself and making recommendations for changes to the framework. These are provided in a separate report on the effectiveness evaluation framework (UNEP/POPS/COP.8/INF/41).

B. Information collection, compilation, synthesis and evaluation

199. This report is based on a compilation of the various information and data available to facilitate the evaluation of the effectiveness of the Convention. The Secretariat collected and compiled available scientific, environmental, technical and economic information, including the sources specified in Article 16 and any relevant additional sources, and prepared a preliminary analysis on the basis of which the present effectiveness evaluation report has been developed by the effectiveness evaluation committee.

200. Article 16 identifies three main streams of information on which the evaluation of the Convention's effectiveness should be based:

[24] SC-4/32.

[25] UNEP/POPS/COP5/31.

[26] UNEP/POPS/COP.6/27/Add.1/Rev.1.

(a) *Reports and other monitoring information:* pursuant to paragraph 2 of Article 16 the Conference of the Parties has adopted a global monitoring plan that provides parties with reports based on information collected at the regional levels under the plan, as well as other monitoring information on the presence of persistent organic pollutants in humans and the environment; to date, the first and second monitoring reports have been developed in the frame of the global monitoring plan and are considered in the present report;

(b) *National reports and other information on measures taken to implement the provisions of the Convention*: the Secretariat compiles information that it receives from Parties pursuant to Article 15; as of 30 April 2016, 77 national reports have been submitted by parties for their third reporting and are considered in the present report;

(c) *Non-compliance information*: the Conference of the Parties has not yet been able to agree to procedures and mechanisms for the implementation of Article 17, on non-compliance. As a result there is no information on compliance provided pursuant to such procedures.

201. The reports from these three main streams of information, with the addition of other available scientific, environmental, technical and economic information, form the basis of the effectiveness evaluation. This includes, in addition to the sources specified above, reports on technical assistance, on the financial mechanism, and any other relevant available information. In particular, national implementation plans under Article 7 of the Convention provide additional information to complete the dataset for effectiveness evaluation. As of 30 April 2016, 163 parties had submitted their implementation plans, 38 had submitted their updated implementation plans addressing COP-4 amendments and 32 those addressing the COP-5 amendment to the Convention; these are considered in this report along with the other information sources specified in Article 16. It should be noted that the NIPs are useful in terms of descriptions of the types of measures parties have taken to implement their obligations, however they do not address implementation aspects themselves.

C. Information analysis

202. According to the framework for effectiveness evaluation, the evaluation would conform to the standards for evaluation in the United Nations system (United Nations Evaluation Group 2005). This includes:

(a) Using appropriate methods of analysis and synthesis to summarize findings;

(b) Interpreting the significance of results;

(c) Making judgments according to clearly stated values that classify a result (e.g., as positive or negative and high or low);

(d) Considering alternative ways to compare results;

(e) Generating alternative explanations for findings and indicating why they should or should not be discounted;

(f) Recommending actions or decisions that are consistent with the conclusions;

(g) Limiting conclusions to situations, time periods, regions, contexts and purposes to which the findings are applicable.

203. Under the effectiveness evaluation the overall progress achieved under the Convention is evaluated; conclusions relevant to particular parties are provided here only as information inputs. For that reason in most cases the status quo as of the date in which the Convention entered into force or its amendments entered into force for most Parties[27]are used as the baseline to evaluate its effectiveness at the global level. If such information is not available (e.g. monitoring data) the first relevant information that is available is considered as the baseline against which changes over time are evaluated.

[27] The Stockholm Convention entered into force on 17 May 2004. For amendments to Annexes A, B and C to the Convention, this report shall unless stated otherwise and for ease of reading refer to the date of entry into force of the amendment for most Parties. That is to say, the amendment to list alpha hexachlorocyclohexane; beta hexachlorocyclohexane; chlordecone; hexabromobiphenyl; hexabromodiphenyl ether and heptabromodiphenyl ether; lindane; pentachlorobenzene; perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride; and tetrabromodiphenyl ether and pentabromodiphenyl ether entered into force for most Parties on 26 August 2010 and the amendment to list endosulfan entered into force for most Parties on 27 October 2012; the amendment listing hexabromocyclododecane entered into force for most Parties on 26 November 2014; and the amendments adopted by the seventh meeting of the Conference of the Parties have yet to enter into force for any Party.

D. Assumptions

204. The Convention requires Parties to undertake various activities that are intended to contribute to achieving the overall objective of the Convention. Attributing changes observed to measures undertaken is challenging and requires continued attention and monitoring. In addition, since most measures are not carried out in isolation, it may be difficult at times to identify a specific cause-and-effect relationship.

205. Temporal and spatial changes in levels of persistent organic pollutants in the environment are good indicators of whether the objective of the Convention is being achieved since a decrease in those levels over time would decrease exposure to persistent organic pollutants and thus their adverse impacts on human health and the environment. To evaluate the extent to which observed changes can be attributed to the measures undertaken under the Convention, however, a number of factors and concurrent processes must be taken into account. With that in mind the present framework was developed using the following assumptions:

(a) The implementation of national actions to reduce or eliminate the production, use and release of persistent organic pollutants would not have occurred, or would have been less effective or occurred at a later time, if the Convention had not been in place; although measures addressing environmental contamination and human exposure to POPs had already been in place in some regions prior to the Convention, the entry into force of the treaty has transposed such measures at the global level, enabling concerted global action, and a wider scope of action by listing new chemicals;

(b) If implemented, obligations under the Convention would help to protect humans and the environment from the adverse effects of persistent organic pollutants.

E. Challenges

206. The Convention imposes several reporting obligations with varying timelines (national reports, reporting on polychlorinated biphenyls, DDT, national implementation plans, etc.). At any one time, the data available will relate to various time periods, which makes the interpretation and comparison of trends challenging.

207. The implementation of the Convention depends primarily on actions and activities by parties, which constitute a large and diverse group of countries. Collecting comparable data from such a group is complex. Parties report on whether measures have been adopted but in most cases data on the extent of implementation or the success of measures (outcomes) are not readily available. It would be useful, for example, to have information on the extent to which the Convention is being implemented through legal or administrative measures and the extent to which such measures are enforced. Such data are not readily available, however, and when available are not easily compared between countries or regions. The lack of data on outcomes limits the ability to interpret the information available.

208. National reports are the main source of data for the evaluation. A concerted effort is needed to ensure that parties complete their reports in a timely and accurate manner. The lack of national reports has seriously hampered the ability of the Committee to undertake this evaluation.

209. The absence of an established compliance mechanism has resulted in large gaps in information on whether Parties are meeting their obligations under the Convention. Such information is crucial in determining whether the Convention is effective in meeting its objective, as it would provide information for determining non-compliance with its provisions. If all Parties move towards full compliance, and there remain significant levels of listed POPs in the environment, then this could suggest that current Convention controls do not sufficiently address the problem of POPs.

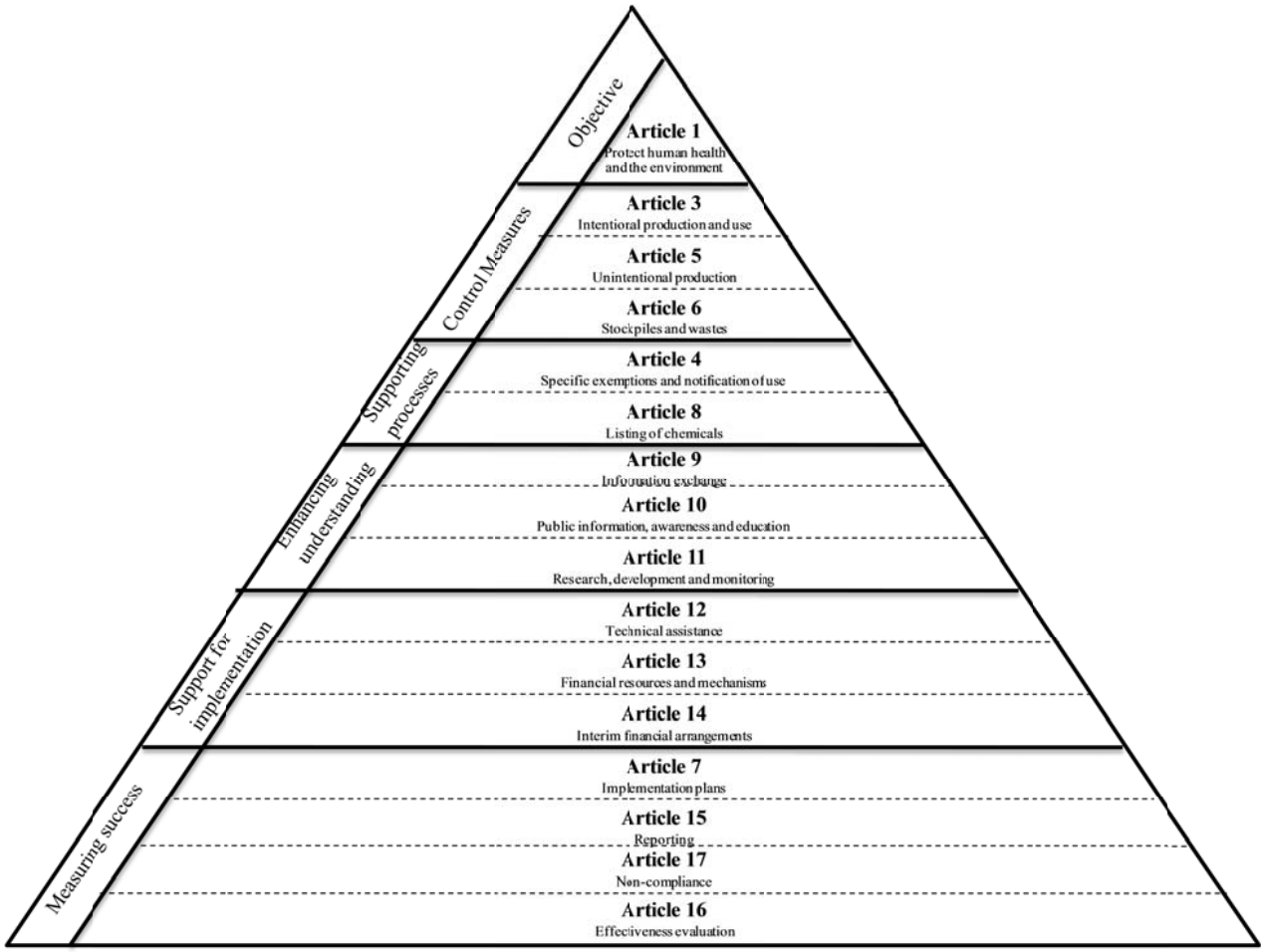
Amendments to Annex A, B or C to the Convention enter into force on the expiry of one year from the date of communication by the depositary of such amendments for all Parties except those that 1) have submitted a notification of non-acceptance of the amendment in accordance with Article 22 paragraph 3 (b) of the Convention ("opt-in" Parties); or 2) that have made a declaration with respect to those Annexes in accordance with Article 25 paragraph 4 ("opt-out" Parties), in which case any such amendment shall enter into force for such Party on the ninetieth day after the date of deposit with the depositary of its instrument of ratification, acceptance, approval or accession with respect to such amendment, in accordance with Article 22 paragraph 4 of the Convention.

II. Evaluation of the effectiveness of the Convention

210. The evaluation is grounded on the Convention's objective to protect human health and the environment from persistent organic pollutants and considers process and outcome indicators. Process indicators measure actions undertaken during implementation (for example, the adoption of legal and administrative measures or the development of national implementation plans). Outcome indicators measure the desired impact of the measures adopted to implement the Convention (for example, reductions in the quantities of persistent organic pollutants released).

211. The evaluation is structured according to the framework (UNEP/POPS/COP.6/27/Add.1/Rev.1), but grouped by main areas of implementation of the provisions of the Convention, as shown schematically in Figure II.1 below. The evaluation begins with the assessment of whether the overall objective of protecting human health and the environment from persistent organic pollutants has been met (section II.A), followed by assessments of the effectiveness of the specific measures to achieve this global objective: control measures to address releases of POPs (section II.B.); processes to support such control measures being taken (section II.C); provisions for information exchange and awareness raising (section II.D) and for support being provided for implementation (section II.E); mechanisms for monitoring success (section II.F); and, finally general and cross-cutting issues(section II.G).

Figure II.1. *Evaluation of the effectiveness of the Convention according to the main areas of implementation as conducted in the present assessment*



212. The sub-sections assessing the effectiveness of each individual Article of the Convention include an overview of the available information used for the assessment, an analysis of the information based on the application of the framework for effectiveness evaluation, a summary of main findings, and conclusions and recommendations derived from the analysis.

213. Based on the assessment described above, section III provides the overall outcomes of the effectiveness evaluation. The full list of references used in the development of this report is included in section IV, while the dataset used for the assessment is included in the annex.

A. Objective

1. Protecting human health and the environment (Article 1)

214. The outcome to be addressed in assessing the effectiveness of efforts to achieve the Convention objective set out in Article 1is whether the levels of persistent organic pollutants in humans and the environment have diminished over time. This represents a global outcome indicator of improved human health and environmental protection.

215. Three indicators have been identified for this outcome:

Outcome indicator 1 Outcome indicator 2 Outcome indicator 3	Changes in levels of each of the listed persistent organic pollutants in air Changes in levels of the listed persistent organic pollutants in humans Changes in levels of the listed persistent organic pollutants in other environmental media, as available
Source of information for the indicators	Global monitoring plan and other relevant monitoring data validated by monitoring experts
Data limitations	Available data, significant geographical gaps and the relevance of long-range transport in the interpretation of trends are discussed in the 2009 global monitoring plan report (decision SC-4/31). To reduce data limitations it is important to increase the comparability of long-term global monitoring data in the core media and to provide support for developing countries and countries with economies in transition to participate in monitoring activities to address the gaps identified in the global monitoring plan report.
Baseline	First global monitoring plan reports or first monitoring result for a particular chemical in a particular geographical location published in the next global monitoring plan reports

(a) Available information

Relevant COP decisions and processes

SC-1/13: Effectiveness evaluation	Agrees to initiate arrangements to provide with comparable monitoring data on which to base its evaluation of the effectiveness of the Convention
SC-2/13: Effectiveness evaluation	Decides to implement the elements for a global monitoring plan
SC-3/19: Effectiveness evaluation	Adopts on a provisional basis the global monitoring plan , adopts the implementation plan, agrees that the guidance on the global monitoring plan provides an appropriate basis to implement the global monitoring plan, establishes regional organization groups and a coordination group
SC-4/31: Global monitoring plan for effectiveness evaluation	Adopts the terms of reference and mandate of the regional organization groups and the global coordination group, welcomes the first regional monitoring reports and the global monitoring report
SC-7/25: Global monitoring plan for effectiveness evaluation	Welcomes the second regional monitoring reports and requests the global coordination group to develop the global monitoring report

216. The second phase of the global monitoring plan has been implemented in accordance with the global monitoring plan for persistent organic pollutants (UNEP/POPS/COP.6/INF/31/Add.1), the implementation plan for the global monitoring plan (UNEP/POPS/COP.6/INF/31/Add.2), and the Guidance on the Global Monitoring Plan for Persistent Organic Pollutants (UNEP/POPS/COP.6/INF/31).

217. The second global monitoring report has been developed on the basis of the five regional monitoring reports (UNEP/POPS/COP.7/INF/38) by the coordination group for the global monitoring plan. The report synthesizes information from the first (2000-2008) and second (2009-2015) phase of the global monitoring plan and presents the current findings on POPs concentrations at the global scale (UNEP/POPS/COP.8/INF/38).

(b) Analysis of available information and application of the framework

Outcome indicators 1-3: Changes in levels of each of the listed persistent organic pollutants in air, humans and other media

218. Long time series monitoring data of legacy POPs in air, human matrices and other media are available from Asia and the Pacific, CEE and WEOG, while information on changes in concentrations over time is still lacking in Africa and GRULAC. Information on changes over time in concentrations of the newly listed POPs is still limited.

219. The trend information available from Asia Pacific, CEE and WEOG indicates that, overall, concentrations of POPs measured in air have largely decreased; a steep decrease in air concentrations of legacy POPs (OCPs, PCB, PCDD/Fs) seems to have followed their early regulation in the 1980s. By 2000, the majority of primary sources had been controlled and the relatively low levels that are currently measured are declining slowly or do not show significant changes.

220. In general, air concentrations of the newly listed POPs (such as PBDEs, PFOS, HBCD, PeCB) seem to show increases over the 1990s, then leveling off and decreasing in the early 2000s. Among these, HCHs are the only compound group that has sufficiently resolved monitoring data to assess time trends (Figure A.1.1, (a), (c)). The atmospheric decline rates of γ-HCH have accelerated in both the Arctic and the Great Lakes region following North American restriction of the pesticide lindane, which contains almost pure γ-HCH.

221. PCB 52 at the Arctic station of Stórhöfði in Iceland has shown steadily increasing trends over the past few years of the time series. Such instances of increasing trends are attributed to the re-emission of PCB previously deposited and accumulated in water, ice and soil that have started to be released back to air due to a warming Arctic and the associated retreating sea ice and melting glaciers (Figure A.1.1, (b)). This is an exception and generally declining trends in air are reported (Figure A.1.1, (d)).

222. Figure A.1.2 shows decreasing DDT concentrations measured in air at Hedo, Okinawa, from 2009 to 2013.

Figure A.1.1. *Time trends of (a) γ-HCH measured in air at the Canadian Great Lake site of Point Petre and (b) PCB 52 at the arctic station of Stórhöfði in Iceland. Also shown are the general summary pie charts of time trends observed in the WEOG region for (c) γ-HCH and (d) PCB 52. (Source: Western Europe and Others Group Region Report)*

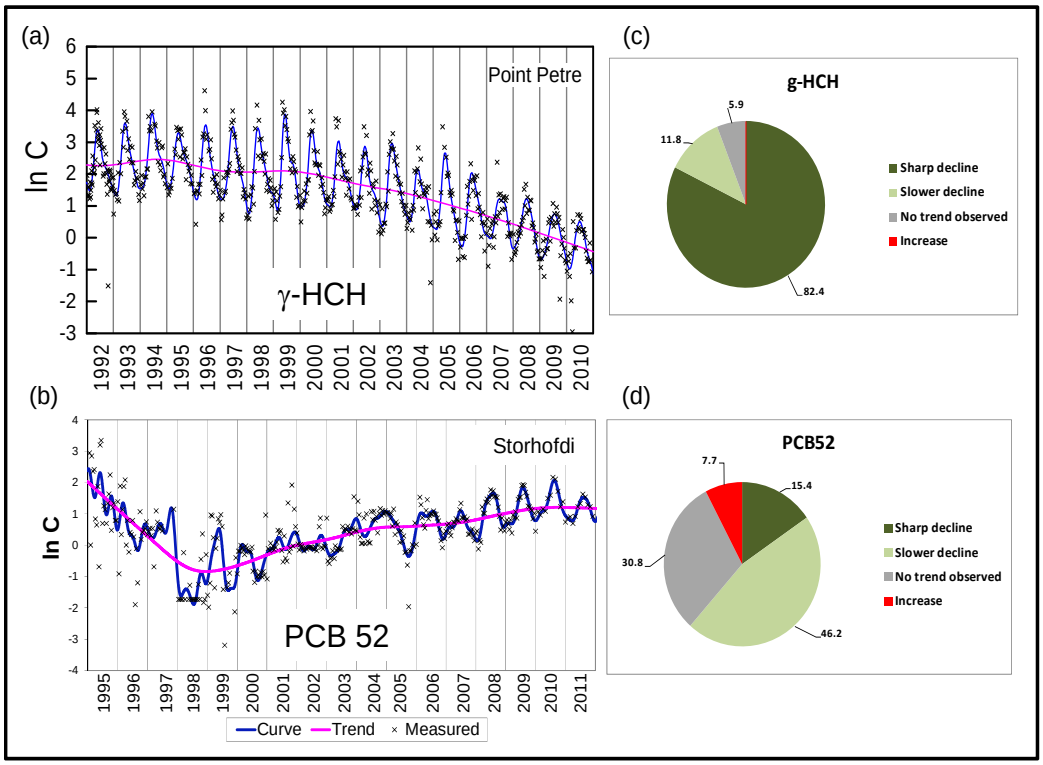
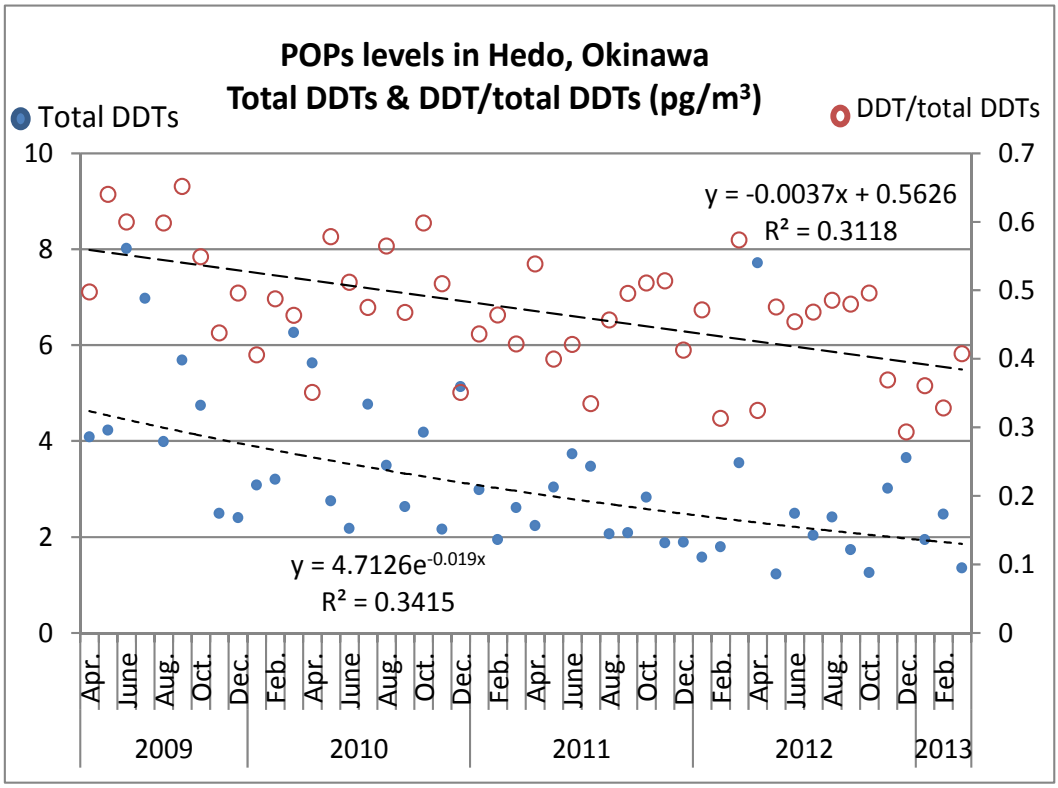


Figure A.1.2. *Changes in monthly total DDT levels in air and the ratios between DDT and total DDT in Hedo, Okinawa. Total DDT refers to the sum of six isomers, i.e., p,p'- and o,p'-DDTs, DDEs and DDDs. DDT refers to the sum of p,p'-DDT and o,p'-DDT (Source: Asia and the Pacific Region Report)*



223. Changes over time in human exposure to POPs show a similar downward pattern as in air, but the decrease in some POPs seems to be more significant after 2000 than in air samples. As an example, Figure A.1.3 shows decreasing concentrations of indicator PCB in human milk throughout the globe.

224. Similar decreasing trends are equally observed for concentrations of POPs measured in other media[28]. The overall picture that emerges is that organochlorine pesticides and legacy POPs (PCDD/PCDF, PCB) did decrease significantly from peak values in the 1970s to the early 2000s but the measured values since then do not show significant trends and in some cases small increases have been observed. More recently listed POPs (such as PBDEs, HCBD, PFAS, endosulfan) show increasing trends over the past decade, the increases in some cases (PFAS) seem to slow down or stabilize. Despite the significant decreases of some POPs since the 1980s the ubiquitous presence of mixtures of relatively low levels of a numerous multiplicity of POPs gives reasons for concern.

225. As to PFOS concentrations in water, temporal trend information is currently very limited. Differences in sampling locations and in detection limits currently preclude any robust assessment of trends of PFOS concentrations in water.

226. More detailed information on changes over time in POPs concentrations measured in core media is provided in Table A.1.1 below.

[28] Other non-core media include precipitation, water (for POPs other than PFOS), snow ice, soil sediment and biota (invertebrates, fish, birds, mammals).

Figure A.1.3. *Trends in concentrations of indicator PCB in human milk over the period 1988 to 2010 (Sum of 6 PCB; ng/g fat) (Source: Global Monitoring Report)*

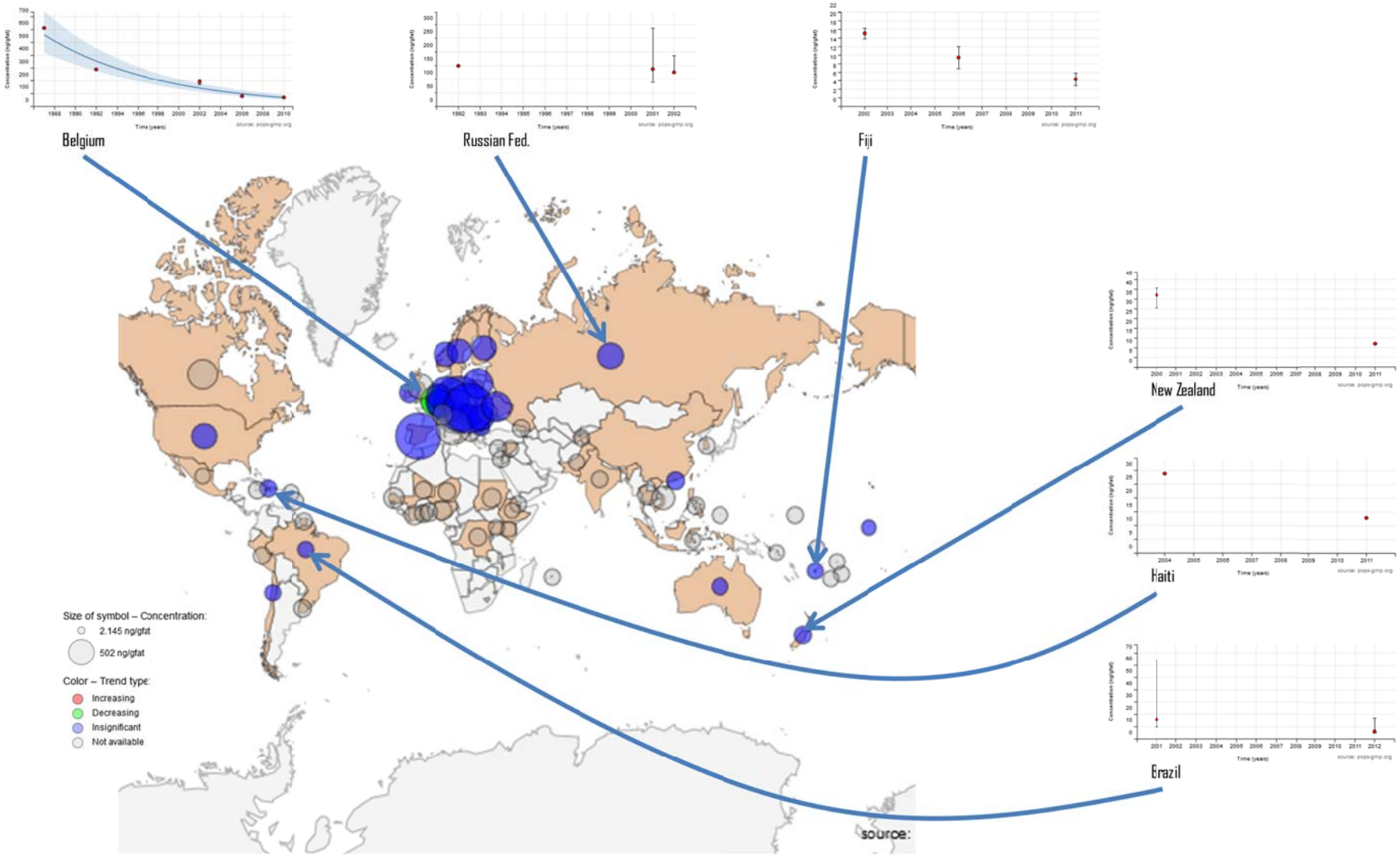


Table A.1.1. *Changes over time in POPs concentrations measured in air and human matrices. Shadings indicates: green – generally decreasing trends; red – increasing trends; blue – no change or cannot establish trend; white – no trend data; ★- warning to indicate limited data (Source: Global Monitoring Report)*

Chemical	Air					Human matrices				
	Africa	Asia and the Pacific	Central and Eastern Europe	Latin American &Caribbean States	Western Europe and Other Groups	Africa	Asia and the Pacific	Central and Eastern Europe	Latin American &Caribbean States	Western Europe and Other Groups
aldrin	Baseline data available	Mostly below LOD or poor recovery	Baseline data available at 2 sites	Baseline data available.	Decline in Great Lakes; no trend in Arctic ★	Below LOQ	Below LOD or <LOQ	Below LOQ	Below LOQ	Below LOD
chlordanes	Baseline data available	Decreasing in Japan. Mostly below LOD in China ★	Baseline data available at 6 sites	Baseline data available.	Mostly declining trends	degradation product oxychlordane detected	No decrease since 1998 in Japan; Oxychlordane detected with decreasing levels over time in Fiji ★	degradation product oxychlordane detected	degradation product oxychlordane detected	degradation product oxychlordane detected
chlordecone	Below LOD at all sites.	Below LOD in Japan.	Monitored at 1 site all below LOD.	Baseline data available.		-	-	-	-	-
DDT and transformation products	No discernable trends	Decrease in Japan ★	Mostly no trend / Declining at 8 sites	Baseline data available.	Mostly declining trends	Baseline data available.	Decrease from 1972 to the first half of 1990s, then leveling off in Japan; Decreasing concentrations over time measured in Fiji ★	No detectable trend.	Declining concentrations in Haiti, no change in Chile ★	Declining trend in human milk (Swedish mothers), or below LOD
dieldrin	No discernable trends	No trend in Japan; Mostly below LOD in China; Baseline data available in other countries ★	Baseline data available at 4 sites	Baseline data available.	Decline in Great Lakes; no trend in Arctic	Baseline data available.	Declining trend in Japan; Decreasing concentrations over time measured in Fiji ★	Baseline data available	Declining concentrations measured over time in Haiti, Chile ★	Measured at low levels
endosulfan	Decreasing tendencies at 3 sites, not changing at	Baseline data available in Fiji (below LOD) and	Baseline data available at 4 sites	Baseline data available.	Decline in Europe and / No change in	alpha-endosulfan detected in one sample ; beta-	Baseline data available	Below LOQ	Below LOQ	Below LOD

Chemical	Air					Human matrices				
	Africa	Asia and the Pacific	Central and Eastern Europe	Latin American &Caribbean States	Western Europe and Other Groups	Africa	Asia and the Pacific	Central and Eastern Europe	Latin American &Caribbean States	Western Europe and Other Groups
	others ★	Japan			Great Lakes / Arctic	endosulfan<LOQ; endosulfan sulphate measured in two samples				
endrin	Baseline data available	No trend in Japan; Mostly below LOD in China; Baseline data available in other countries ★	Baseline data available at 2 sites	Baseline data available.	No discernable trend in the Arctic ★	Below LOQ	Below LOD or <LOQ	Below LOQ	Below LOQ	Below LOD
HBB	Variable trends at different sites	Baseline data available in Fiji and Japan (below LOD)		Baseline data available.		Levels below LOQ but in one country	Baseline data available	Below LOQ	Below LOQ	Concentrations are low and mostly undetected
HBCD	No discernable trends	Baseline data available in Fiji (below LOD) and Japan		Baseline data available.	Decreasing at 1 Arctic site. No trend in urban Great Lakes. Mostly below LOD at other sites ★	Baseline data available	Increasing concentrations measured over 1974-2006 in Japan	Baseline data available	Baseline data available	Increasing till 2002, then leveling off in 2003-2004 in Sweden
HCB	Variable trends at different sites	No trend in Japan. Baseline data available in other countries ★	Mostly no trend / Decreasing at 1 site / Increasing at 1 site	Baseline data available.	Very slow decline at most sites / Increasing in 2 Arctic sites	Baseline data available.	Decrease from 1980 to the first half of 1990s, then levelling off in Japan; No change in levels in Fiji ★	Significant decrease in concentrations from two consecutive years in the Czech Rep ★	Decreasing concentrations over time measured in Brazil, Haiti ★	Declining trend from German ESB data
α-HCH	Decreasing tendency at all sites	Baseline data available.	Mostly no trend / Decreasing at 12 sites	Baseline data available.	Sharp decreases at most sites	Below LOQ		Baseline data available	Below LOQ	Below LOD
β-HCH	Baseline data available	Baseline data available	Mostly no trend / Decreasing at 6 sites	Baseline data available.	Concentrations very low and mostly below	Baseline data available.	Decrease from 1972 to the first half of 1990s in Japan, then	Baseline data available	Decreasing concentrations over time measured in	levels of β-HCH detected, but not in all samples

Chemical	Air					Human matrices				
	Africa	Asia and the Pacific	Central and Eastern Europe	Latin American &Caribbean States	Western Europe and Other Groups	Africa	Asia and the Pacific	Central and Eastern Europe	Latin American &Caribbean States	Western Europe and Other Groups
					LOD ★		leveling off		Brazil, Chile ★	
γ-HCH	Variable trends at different sites	Baseline data available.	Mostly no trend; Decreasing at 20 sites	Baseline data available.	Sharp decreases at most sites	Baseline data available	Baseline data available	Baseline data available	Baseline data available	Measured at low levels
heptachlor	Baseline data available	Decreasing in Japan; Mostly below LOD in China; Baseline data available in other countries ★	Baseline data available at 4 sites	Baseline data available.	Decline in Great Lakes; No trend in Arctic	Baseline data available	Declining trend in Japan. Below LOD in Pacific islands and China	Below LOD for heptachlor and trans-heptachlorepoxide; decrease for cis-heptachlor suggested from two data points in the Czech Rep. ★	Baseline data available for trans-heptachlorepoxide	Metabolite detected
mirex	Baseline data available	No trend in Japan. Mostly below LOD in China. Baseline data available in other countries	Baseline data available at 2 sites	Baseline data available.	Declining in the Great Lakes ★	Below LOQ	Mostly below LOQ, measured at low levels in China	Below LOQ	Below LOQ	Below LOD
PBDEs	No discernable trends	Baseline data available in Fiji and Japan	Baseline data available at 3 sites	Baseline data available.	Decreasing in Europe and some Great Lakes sites ★; No trend in Arctic Canada; Increasing at 3 Great Lakes sites	Baseline data available.	Baseline data available.	Baseline data available.	Baseline data available.	Increasing concentrations in Nunavik (Canada); Concentrations reported to be leveling off or decreasing in Sweden and Norway; No significant time trend in Australia
PCB	No discernable trends	Decreased in Japan 1974-1988 and remained at	Mostly no trend; Declining at 14	Baseline data available.	Mostly declining. Slow decline; Increasing at 1 Arctic	Baseline data available.	Decreasing trend from 1972 to 1990s in Japan, then leveling off;	Significant decrease in CEE countries that used	Declining concentrations measured over time in Haiti and	Declining concentrations over time in human milk

Chemical	Air					Human matrices				
	Africa	Asia and the Pacific	Central and Eastern Europe	Latin American &Caribbean States	Western Europe and Other Groups	Africa	Asia and the Pacific	Central and Eastern Europe	Latin American &Caribbean States	Western Europe and Other Groups
		similar level since then. ★	sites		in Great Lakes site.		Decreasing concentrations in Fiji ★	PCB in paints ★	Chile ★	and blood
PCDD/PCDF	Variable trends at different sites	General reduction tendency	Baseline data available at 1 site	Baseline data available	Declining in the Alps and UK urban sites. No change at US sites and UK rural sites.	Baseline data available.	Declining trend in Japan till 1998, then leveling off	Decrease observed in several countries in the region	Declining concentrations measured over time in Haiti and Chile ★	Declining concentrations over time in human milk and blood
PFOS		Baseline data available in Fiji and Japan	Baseline data available at 1 site	Only Uruguay reported air data	In Arctic air, PFOS shows no trend. PFOS precursors show no trend or are decreasing ★	Baseline data available	Two studies from Japan indicate: 1. concentrations have increased over the past 25 years; 2. concentrations in blood have decreased from 2003 to 2011	Baseline data available	Baseline data available	Declining trend in NHANES, declining as of 2000 in German ESB data, declining in Australia
PeCBz	Variable trends at different sites	Baseline data available.	Decreasing at 1 site ★	Baseline data available.		Levels below LOQ but in one country	Baseline data available	Baseline data available	Baseline data available.	Below LOD
toxaphene		Baseline data available				Baseline data available	Mostly <LOQ, measured at low levels in China and Pacific Isl.	No significant change in concentrations from two data points in the Czech Rep. ★	Baseline data available	Measured at low levels

227. In several instances, the levels measured in the environment are slowly decreasing or have stabilized (e.g. PCB, PCDD, PFOS), while the levels in humans are showing larger decreases. Levels of some POPs in humans are decoupled to some extent from environmental concentrations, as mediated by other factors, probably through increased awareness of populations. This points to the overall impact of the Convention at the global level, through major changes of behavior and of mindset leading to decreased exposure.

228. These results show that the existence of targeted regulations is working toward reducing levels of POPs in the environment, including those that predated the Convention in some regions. The Convention requires all parties to implement relevant regulations, and the results suggest that regulatory action at the global level has contributed to overall decreasing levels of POPs in the environment and in humans, and should further prove effective for the POPs that can still be found in commerce.

(c) Main findings

Ambient Air

229. For most legacy POPs (those 12 substances listed when the Convention entered into force in 2004),concentrations in air have declined and continue to decline or remain at low levels due to restrictions on POPs that predated the Stockholm Convention and have been maintained since. For many newly listed POPs (those POPs listed after 2004) concentrations in air in some regions are beginning to show declining tendencies, although in a few instances, increasing and/or stable levels are observed.

Human tissues (milk and blood)

230. In regions with sufficient data to evaluate changes over time, levels of legacy POPs such as polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF), polychlorinated biphenyls (PCB), and DDT/DDE[29], including their transformation products, have generally declined in human tissues. For the newly listed POPs, information regarding changes over time is very limited. Based on studies available from the Western Europe and Others Group and from Asia Pacific, the levels of brominated diphenyl ethers (BDEs) and perfluorooctane sulfonic acid (PFOS) seem to be gradually declining.

Water

231. Temporal trend information for PFOS in water is very limited. Differences in sampling locations and in detection limits preclude any robust assessment of trends for now.

Other media

232. There are clear declines of legacy POPs from the 1970s until 2000 and few changes thereafter. More recently listed POPs (such as PBDEs, HBCD, PFOS and endosulfan) show increasing trends over the period from 2004 to 2014; the increases in some cases (e.g., PFOS) seem to have slowed down or stabilized and some decreasing trends are also detected.

(d) Conclusions and recommendations

233. Monitoring data suggest that the existence of targeted regulations, including those that predated the Convention in some regions, is working toward reducing levels of POPs in the environment and in human populations. Effective regulatory actions at the global level post-entry into force of the Convention, particularly for listed POPs that are still in commerce, are expected to lower environmental concentrations in the long term.

***Recommendation**: Global monitoring of POPs, as well as data sharing and modelling should be sustained in the long term to confirm decreasing concentrations of legacy POPs in the environment and in humans and to identify trends in the concentrations of the newly listed POPs.*

B. Control Measures

1. Measures to reduce or eliminate releases from intentional production and use (Article 3)

234. The outcomes to be addressed in assessing the effectiveness of Article 3 in helping to achieve the Convention objective are:

(a) Have the production, use, import and export of the chemicals listed in Annex A been eliminated?;

[29] 1,1,1-trichloro-2,2-bis(4-chlrophenyl)ethane (DDT); 1,1-dichloro-2,2-bis (4-chlorophenyl) ethylene (DDE).

(b) Have the production, use, import and export of the chemicals listed in Annex B been restricted?;

(c) Have the production and use of new pesticides or new industrial chemicals that have the characteristics of persistent organic pollutants been prevented?

235. Four indicators have been identified for these outcomes:

Process indicator 1	The date on which each party has implemented measures, including legal and administrative measures, to control the production, import, export and use of persistent organic pollutants listed in Annexes A and B that meet or exceed the Convention's requirements
Source of information for the indicator	Section II of part B of the national reports
Data limitations	The date of implementation of a measure would not reflect voluntary actions that took place before the measure was in place. The degree to which the measure is implemented would not be measured, nor its enforcement.
Baseline	Entry into force of the Convention or its amendments.
Outcome indicator 2	For each chemical listed in Annexes A and B, changes in quantities produced, used, imported and exported for use
Source of information for the indicator	Section VI of part B of the national reports
Data limitations	Data reported are not always for the same span of years. Data for certain years may be missing or available only for a range of years. Parties might not indicate whether imports or exports were for use or disposal.
Baseline	Entry into force of the Convention or its amendments
Outcome indicator 3	For each chemical listed in Annexes A and B, changes in quantities imported or exported for environmentally sound waste disposal
Source of information for the indicator	Section VI of part B of the national reports
Data limitations	Data reported are not always for the same span of years and may be missing. Parties might not indicate whether imports or exports were for environmentally sound waste disposal. Nuances of the data need to be properly appreciated, as persistent organic pollutants will have to be disposed of once production and use have ceased.
Baseline	Entry into force of the Convention or its amendments.
Process indicator 4	The number of parties with regulatory and assessment schemes for new pesticides and/or new industrial chemicals
Source of information for the indicator	National reports, section II of part B.
Data limitations	
Baseline	Entry into force of the Convention

(a) Chemicals addressed under Article 3

236. Article 3 provides measures to reduce or eliminate releases from intentional production and use of chemicals listed in Annex A and Annex B to the Convention. As of 30 April 2016, the following chemicals are listed in Annex A and Annex B:

(a) Annex A: aldrin, alpha hexachlorocyclohexane, beta hexachlorocyclohexanechlordane, chlordane, chlordecone, dieldrin, endrin, heptachlor, hexabromobiphenyl, hexabromocyclododecane, hexabromodiphenyl ether andheptabromodiphenyl ether, hexachlorobenzene, hexachlorobutadiene, lindane, mirex, pentachlorobenzene, pentachlorophenol and its salts and esters, polychlorinated biphenyls, polychlorinated naphthalenes,technicalendosulfan and its related isomers,tetrabromodiphenyl ether and pentabromodiphenyl ether and toxaphene;

(b) Annex B: DDT, perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride.

237. Table B.1.1 summarizes the chemicals listed in Annex A and Annex B with abbreviations used in this report. It also indicates whether the chemical is a pesticide or an industrial chemical and whether the specific exemptions or acceptable purposes are available as of 2016 (see also section II.C.1 of this report).

238. Furthermore, in this section of the report, the 10 intentionally produced POPs listed at the time of the entry into force of the Convention in 2005 are collectively referred to as the 10 initial or legacy POPs, and the POPs listed in 2009 and 2011 are collectively referred to as the 10 newly listed POPs.

Table B.1.1. *Chemicals listed in Annexes A and B to the Stockholm Convention*

Annex A: Elimination			
Chemical		**Specific exemption**	**Use**
Initial POPs	Aldrin	No longer available	Pesticide
	Chlordane	No longer available	Pesticide
	Dieldrin	No longer available	Pesticide
	Endrin	None	Pesticide
	Heptachlor	No longer available	Pesticide
	Hexachlorobenzene	No longer available	Industrial chemical/pesticide
	Mirex	No longer available	Pesticide
	Polychlorinated biphenyls (PCB)	Available	Industrial chemical
	Toxaphene	None	Pesticide
POPs listed in 2009	Alpha hexachlorocyclohexane (AlphaHCH)	None	Pesticide
	Beta hexachlorocyclohexanechlordane (BetaHCH)	None	Pesticide
	Chlordecone	None	Pesticide
	Hexabomorobiphenyl	None	Industrial chemical, flame retardant
	Hexabromodiphenyl ether and heptabromodiphenyl ether (hexa and heptaBDE)	Available	Industrial chemical, flame retardant
	Lindane	Available	Pesticide
	Pentachlorobenzene	None	Industrial chemical/pesticide
	Tetrabromodiphenyl ether and pentabromodiphenyl ether (tetra and pentaBDE)	Available	Industrial chemical, flame retardant
POPs listed in 2011	Technical endosulfan and its related isomers (endosulfan)	Available	Pesticide
POPs listed in 2013	Hexabromocyclododecane (HBCD)	Available	Industrial chemical, flame retardant
POPs listed in 2015	Hexachlorobutadiene (HCBD)	None	Industrial chemical
	Pentachlorophenol and its salts and esters (PCP)	Available	Pesticide
	Polychlorinated naphthalenes (PCN)	Available	Industrial chemical
Annex B: Restriction			
Chemical		**Specific exemption /Acceptable purpose**	**Use**
Initial POPs	DDT	Specific exemption / acceptable purpose available	Pesticide

POPs listed in 2009	Perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride (PFOS, its salts and PFOSF)	Various specific exemptions and acceptable purposes available	Industrial chemical/pesticide

(b) Available information

239. The information relevant to indicators 1, 2, and 3 was collected from either the third, second, first national reports or the national implementation plans (NIPs). Of the 180 parties to the Stockholm Convention, 164 parties had submitted at least one of the four sources of information. The information has been compiled in a table available in the Annex to this report. The information on the use of POPs was solely obtained from the NIPs as it was not asked in the national reports. As the NIPs outline a plan for implementing treaty obligations, rather than reporting on how they were actually implemented, the information they provide has its limitations, but can be useful for example in outlining information on inventories and measures.

240. For indicator 4, in addition to the information from the third national reports, the POPs Review Committee at its fifth meeting requested the Secretariat to seek information from parties and observers on the functioning of regulatory and assessment schemes for new and existing pesticides and industrial chemicals. The compilation of information was updated and presented at the fifth meeting of the Conference of the Parties in document UNEP/POPS/COP.5/INF/9. That information is summarized in this report.

241. The amendments to list the 9 new POPs (alpha HCH, beta HCH, chlordecone, hexabromobiphenyl, hexa and heptaBDE, lindane, pentachlorobenzene, tetra and pentaBDE and PFOS, its salts and PFOSF) entered into force for most of the parties on 26 August 2010. The amendment to list technical endosulfan and its related isomers (endosulfan) entered into force for most of the parties on 27 October 2012.The information on those 10 newly listed POPs is reported in the third national reports.

242. The amendment to list HBCD entered into force for most of the parties on 26 November 2014. The amendments to list HCBD, pentachlorophenol and its salts and esters, and polychlorinated naphthalenes entered into force for most of the parties on 15 December 2016. The information on those chemicals is expected to be reported in the fourth national report to be submitted in 2018.Therefore those chemicals are not covered in the current report.

243. With regard to DDT, PCB, PFOS, its salts and PFOSF and BDEs (hexa and heptaBDE, tetra and pentaBDE), there are separate processes for collecting and reviewing information. The information made available through such processes is discussed in the separate sub-sections.

244. Information on the changes in concentrations of these chemicals in the environment and in human populations is presented in section II.A.1 of this report (see Table A.1.1).

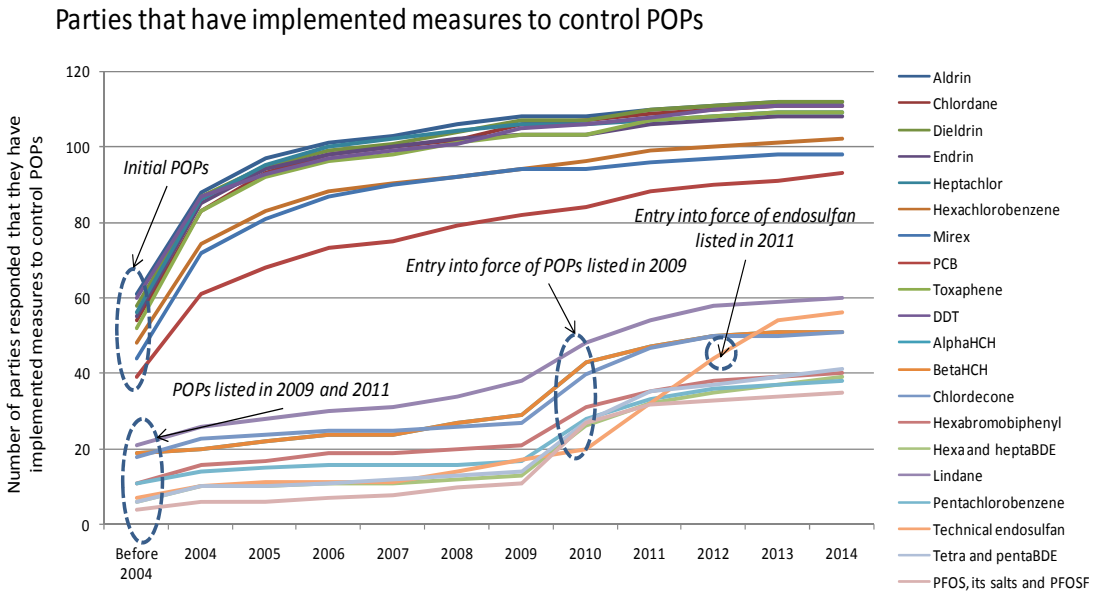
245. The information on import and export for environmentally sound waste disposal is discussed in section II.B.3of the current report (Article 6).

(c) Analysis of available information and application of the framework

Process indicator 1: The date on which each party has implemented measures, including legal and administrative measures, to control the production, import, export and use of persistent organic pollutants listed in Annexes A and B that meet or exceed the Convention's requirements

246. Figure B.1.1 illustrates the changes in the total number of parties that have implemented measures to control POPs on an annual basis, over the period from before 2004 to 2014.

Figure B.1.1. *Changes in the number of parties that have implemented measures, including legal and administrative measures, to control the production, import, export and use of POPs, from before 2004 and up to 2014*



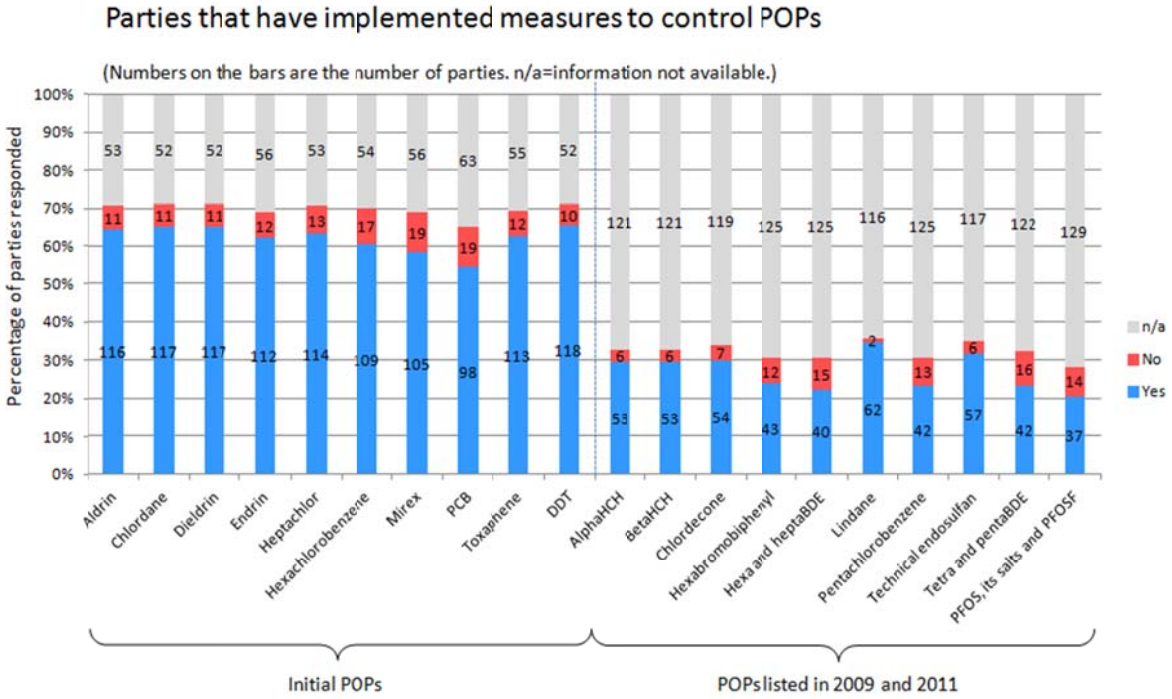
247. A number of parties (39-61 parties per chemical) indicated that the measures to control the production, import, export and use of the initial 10 POPs were implemented before 2004.

248. A peak in 2010 is observed for the number of parties that implemented measures for the 9 POPs listed in 2009. This is most likely a result of the entry into force of the amendments for most parties to list those chemicals in 2010, but is still quite low at 18%.

249. An increase from 2011 to 2013 was observed for the number of parties that implemented measures for endosulfan listed in 2011. This is also likely a result of the entry into force of the amendment for most parties in 2012, but the rate is still low at 12%.

250. Figure B.1.2 illustrates the total number of parties having implemented measures to control the production, import, export and use of POPs during the period from before 2004 to 2014 on a per chemical basis. Considering that those parties that have implemented measures before 2004 have maintained them post entry into force of the Convention (see figure B.1.1), the baseline situation of the current status of implementation includes cumulative information from before 2004 and post-2004.

Figure B.1.2. *Number of parties that have implemented measures, including legal and administrative measures, to control the production, import, export and use of POPs, from before 2004 to 2014*



251. For the 10 initial POPs, 98-118 parties out of 180 parties (54-66%) responded that they have implemented measures including legal and administrative measures to control the production, import, export and use of POPs. The highest percentage was reported for DDT and the lowest for PCB.

252. For the 10 POPs newly listed in 2009 and 2011, 40-62 parties out of 180 parties (21-34%) responded that they have implemented such measures.

253. The percentage of parties that have implemented measures for the newly listed POPs was lower than that for the initial POPs, which could be partially explained by the more limited availability of information on the newly listed POPs. The source of information on the POPs newly listed in 2009 and 2011 for this indicator relied mainly on the third national report. The submission rate of the third national report was 39%, which raised the percentage of information not available (n/a) to 68%.

254. Of those having responded in the third national report (77 parties), the percentage of parties that have implemented measures for the 10 newly listed POPs was 52-87%, which is a level comparable to the 10 initial POPs. It is, however, possible that many of those who have not submitted the third national report may have not implemented measures to control the newly listed POPs as yet.

255. The highest percentage was reported for lindane (35%) and the lowest for PFOS, its salts and PFOSF (20%). On average, industrial chemicals had a lower percentage of implementation than pesticides.

256. Many parties, in particular developing countries, indicated that there is legislation related to chemicals in general but there is no specific legislation for the listed POPs in their countries. Several other parties reported that the listed POPs have never been registered in their countries so the current regulatory framework does not specifically address listed POPs. In such cases, whether the parties concerned should be considered as they have implemented measures to control POPs was not clear. Some parties considered that they have implemented as the existing general legislation can cover the listed POPs, while other parties considered that they haven't implemented as there was no specific legislation for the listed POPs.

Outcome indicator 2: For each chemical listed in Annexes A and B, changes in quantities produced, used, imported and exported for use

Quantities of chemicals produced

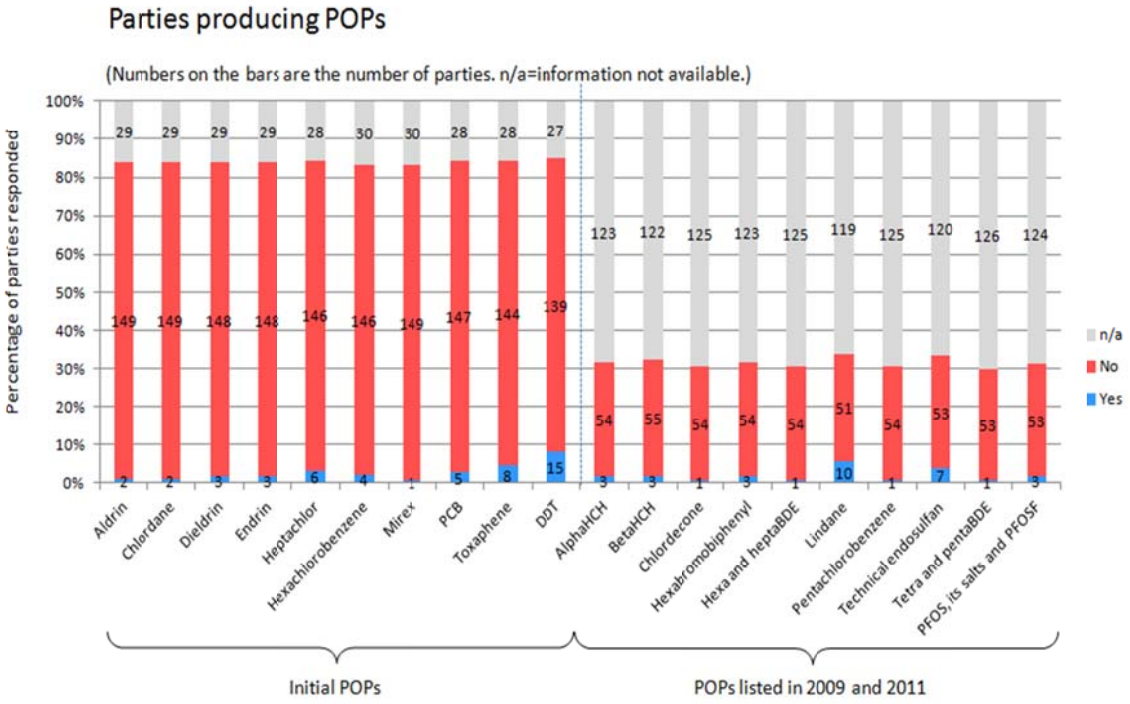
257. The number of parties that produced POPs during the period between before 2004 and 2014 is presented in Figure B.1.3.

258. The production of all 20 POPs was reported by at least one party. Most parties indicated that they have never produced POPs. The information was not available from average 68% of the 180 parties for the 10 POPs newly listed in 2009 and 2011 due to the low rate of submission of the third national report.

259. By comparison, a relatively large number of parties reported production of DDT (15 parties), lindane (10 parties), toxaphene (8 parties), and endosulfan (7 parties). DDT, lindane and endosulfan are chemicals listed with specific exemptions or an acceptable purpose, although the specific exemption for lindane is only for use and not for production. Toxaphene has no specific exemptions.

260. In the national reporting format, parties must respond whether they have produced POPs or not (Yes or No), and provide the information on the year and quantities if available. Most of the parties responded Yes or No to the question (Figure B.1.3), some parties provided the year of production, and only 8 parties reported quantities of POPs produced over the period between before 2004 and 2014(Figure B.1.4). The quantitative information was provided for 7 of the 10 initial POPs (chlordane, heptachlor, hexachlorobenzene, mirex, PCB, toxaphene and DDT) and 5 of the 10 newly POPs (alphaHCH, betaHCH, lindane, endosulfan, tetra and pentaBDE).

Figure B.1.3. *Number of parties that did or did not produce POPs from before 2004 to 2014*

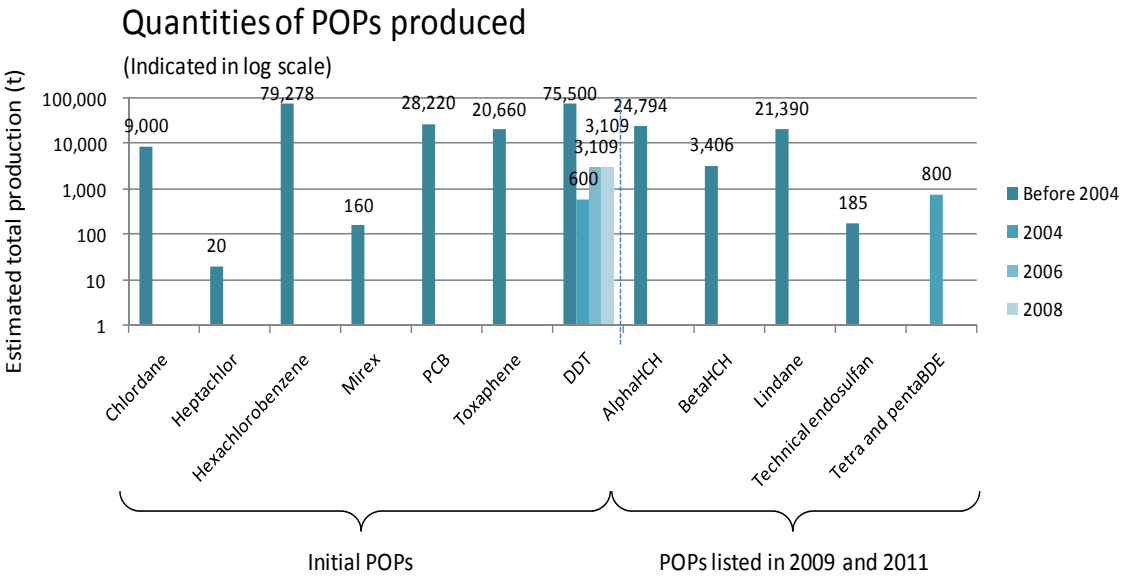


261. Figure B.1.4 illustrates the changes in the quantities of POPs produced annually over the period from before 2004 to2014.DDT was the only chemical with information on multiple years, from which a continued production of DDT can be observed. Other chemicals were reported to have been produced before 2004 or in 2004.

262. The quantitative information on the production of POPs reported by parties is extremely limited, such that it is not possible to discuss trends other than most production of POPs having ceased after 2004.Many parties noted in their NIPs that POPs pesticides produced before 2004 still exist as obsolete stocks. The chemicals listed with specific exemptions or acceptable purposes tend to be produced by more parties. Nevertheless, the limited information and data currently available point to the need for further developing a quantitative global inventory of production, stocks and releases of POPs. Reporting by parties being a central source, but clearly limited, modelling and cooperation with other chemical management initiatives could help towards a transparent and reliable global inventory and its changes over time.

263. The information on the production and use of DDT has also been collected as part of the process for the evaluation of the continued need for DDT for disease vector control pursuant to paragraph 6 of part II of Annex B. Further details are available in the subsection on DDT.

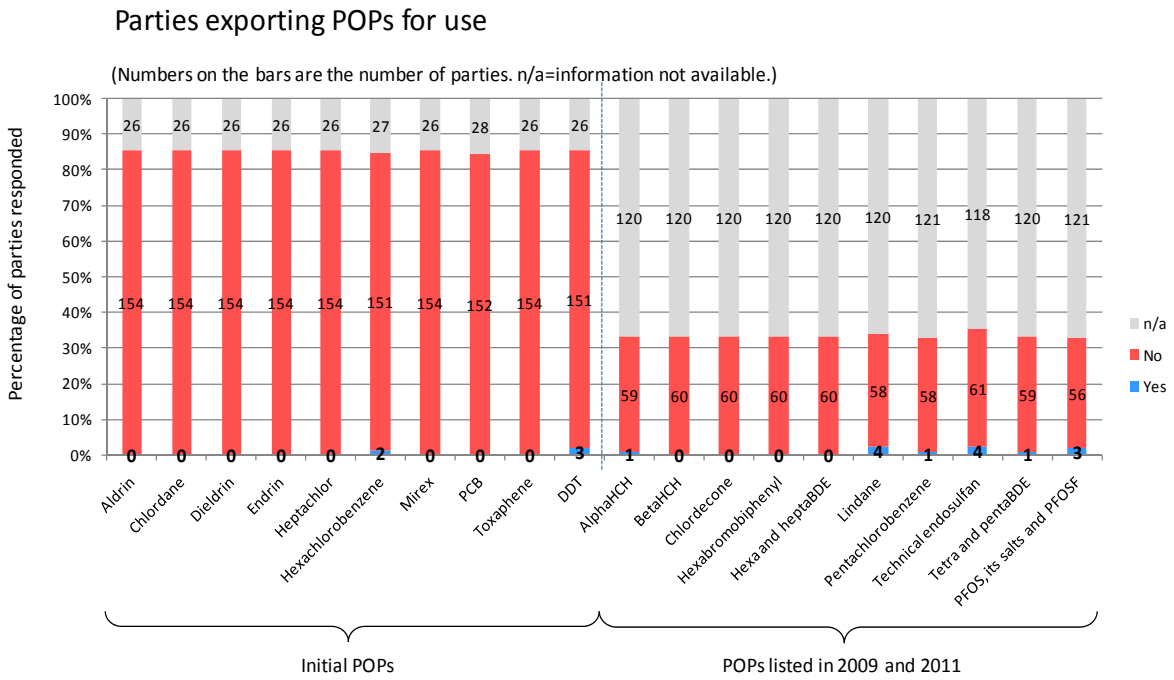
Figure B.1.4. *Changes in the quantities of POPs produced from before 2004 to 2014*



Quantities of chemicals exported for use

264. The number of parties that exported POPs for use during the period from before 2004 to2014 is shown in Figure B.1.5.

Figure B.1.5. *Number of parties that did or did not export POPs for use from before 2004 to 2014*



265. The export of POPs for use was reported for lindane (4 parties), endosulfan (4 parties), DDT (3 parties), PFOS, its salts and PFOSF (3 parties), hexachlorobenzene (2 parties), alphaHCH (1 party), pentachlorobenzene (1 party), and tetra and pentaBDE (1 party).

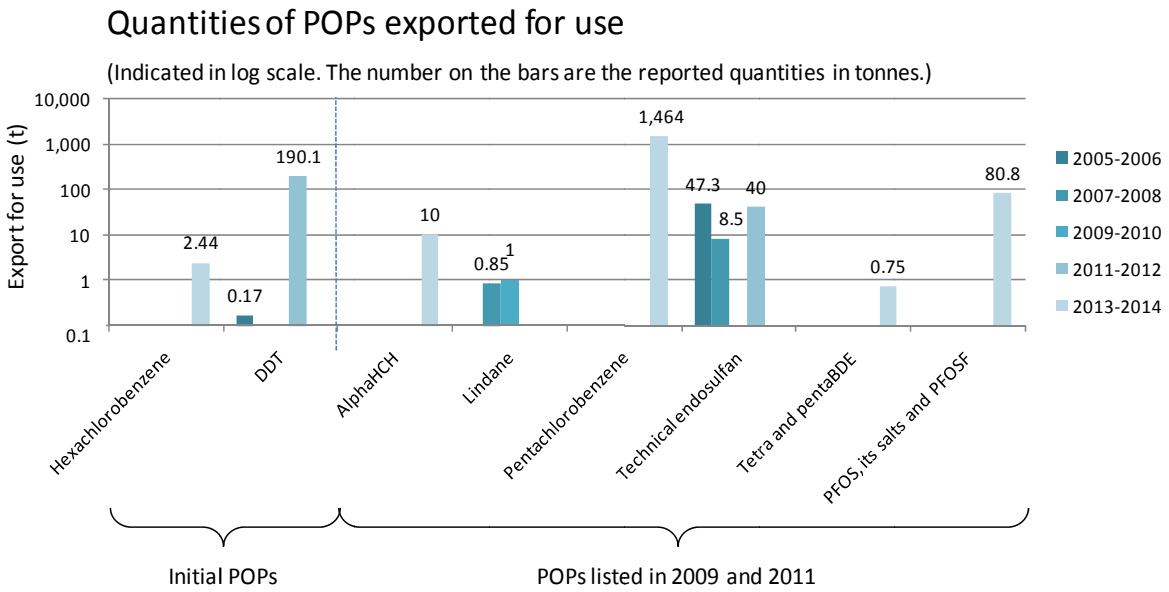
266. Many parties indicated that they have never produced POPs and thus never exported them. According to the information collected from national reports and NIPs, the number of parties responding that they did not export POPs for use was 151-154 parties for the 10 initial POPs and 56-61 parties for the 10 newly listed POPs.

267. A moderate correlation (R^2=0.64) was observed between the number of parties producing and those exporting certain POPs for use, which implies that the producers of POPs are also the main exporters of POPs.

268. Figure B.1.6 illustrates the changes in the quantities of POPs exported for use over the period between before 2004 and 2014.

269. Only 7 parties reported quantities of POPs exported over the period between before 2004 and 2014.The most recent export was reported for hexachlorobenzene, pentachlorobenzene, alphaHCH, tetra and pentaBDE in 2013 and PFOS, its salts and PFOSF in 2014. The largest quantity of export was reported for pentachlorobenzene (1,464 in 2013). The quantitative information on export of POPs for use reported by parties is extremely limited and hinders meaningful discussion of time trends or material flow.

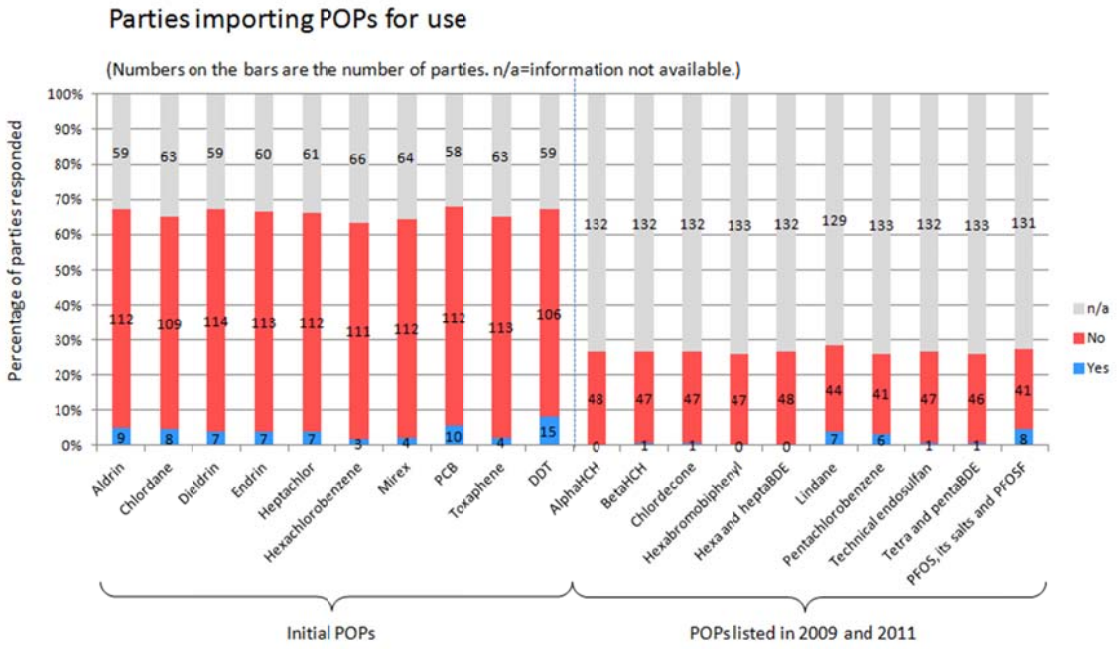
Figure B.1.6.*Changes in the quantities of POPs exported for use from before 2004 to 2014*



Quantities of chemicals imported for use

270. The number of parties that imported POPs for use during the period from before 2004 to 2014 is presented in Figure B.1.7.

Figure B.1.7. *Number of parties that did or did not import POPs for use from before 2004 to 2014*

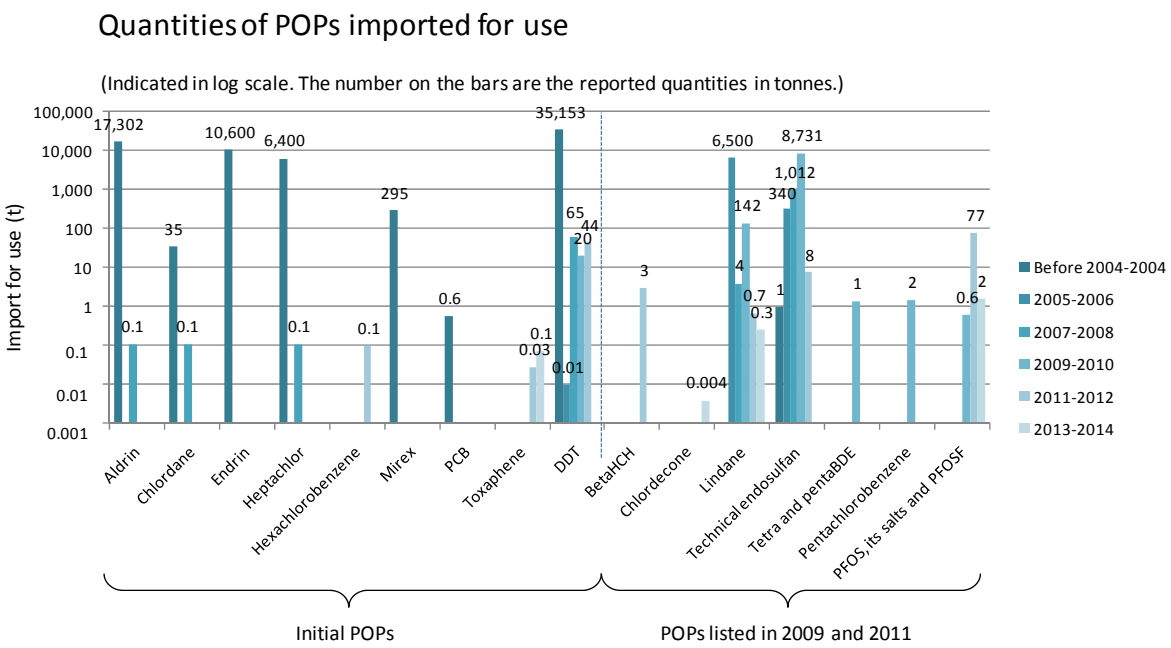


271. The import of POPs for use was reported for DDT (15 parties), PCB (10 parties), aldrin (9 parties), PFOS, its salts and PFOSF (8 parties), chlordane (8 parties), dieldrin (7 parties), endrin (7 parties), heptachlor (7 parties), lindane (7 parties), pentachlorobenzene (6 parties), mirex (4 parties), toxaphene (4 parties), hexachlorobenzene (3 parties), betaHCH (1 party), chlordecone (1 party), endosulfan (1 party), tetra and pentaBDE (1 party). No parties reported import of alphaHCH, hexabromobiphenyl and hexa and heptaBDE for use.

272. The number of parties responded that they have never imported POPs for use was 106-114 parties for the 10 initial POPs and 41-48 parties for the 10 newly listed POPs. The availability of information on import of POPs for use was lower than that of production of POPs and export of POPs for use. The numbers did not match with the information available for the export of POPs for use. As shown in figure B.1.7, more parties did not report whether they have imported POPs for use or not.

273. Figure B.1.8 illustrates the changes in the quantities of POPs imported for use over the period between before 2004 and 2014.

Figure B.1.8. *Changes in the quantities of POPs imported for use from before 2004 to 2014*



274. As shown in figure B.1.8, although the quantitative data are limited, a general decrease in the quantities of POPs imported for use is observed. For the POPs newly listed in 2009 and 2011, while the import of lindane showed decreasing trend, the import of endosulfan increased until 2010 and thereafter decreased. This could be a result of listing of lindane in 2009 and endosulfan in 2011. The import of DDT and PFOS, its salts and PFOSF for use seemed to be continuing.

275. A number of parties, in particular from developing countries reported that the import of POPs is not allowed but there may be illegal traffic and in many cases the quantities were unknown. The issue of illegal traffic is a relevant issue for many countries, and further work under the Stockholm and Basel Convention seems to be needed to address the issue.

276. Several parties noted in their NIPs that the farmers (pesticide users) often use informal names to refer to the POPs or a mixture of POPs, which made it difficult to track quantitative information.

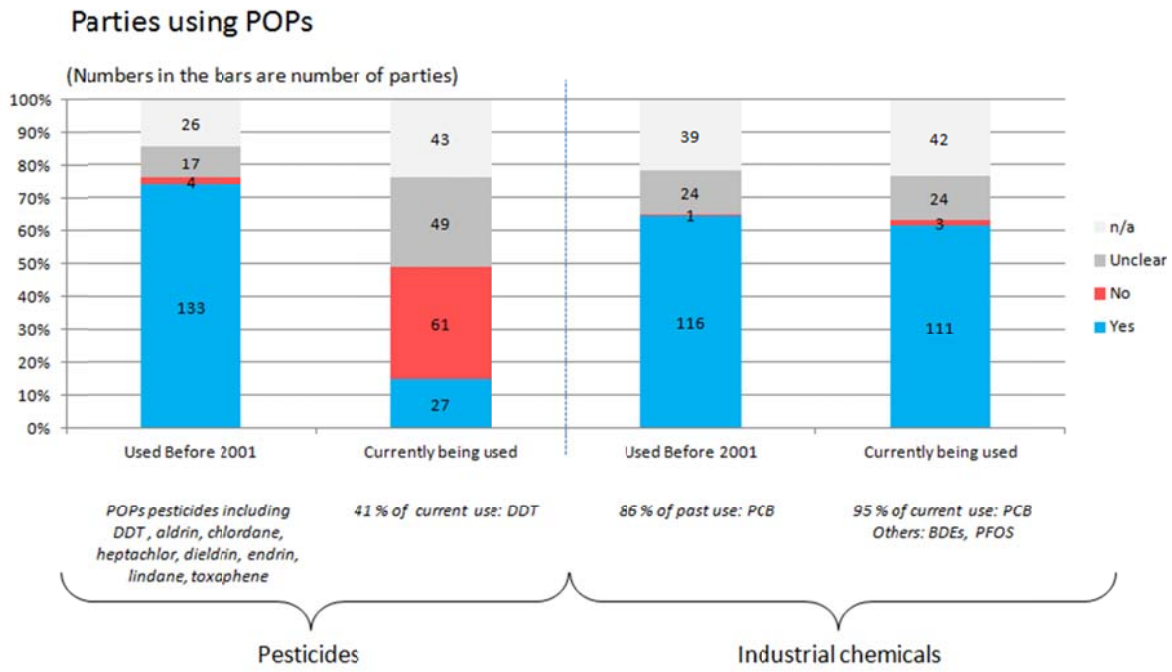
Quantities of chemicals used

277. There is no question in the national reporting questionnaire asking for information on the use of POPs including the quantities. This is due to the fact that, according to paragraph 2 of Article 15, only information on production, import and export is required by the Convention. Therefore the information on the use of POPs was collected form NIPs only.

278. The information on use of POPs described in the NIPs was sometimes not clear or unconfirmed. Some parties indicated that the use of POPs was no longer allowed in their countries but obsolete stockpiles or POPs pesticides illegally imported might be used by farmers. It is also more difficult or the system does not exist to track the quantities of POPs consumed, compared to the quantities of POPs produced, imported or exported.

279. The number of parties that used POPs pesticides and industrial chemicals before 2001 and the number of parties indicating ongoing use of POPs are shown in Figure B.1.9.

Figure B.1.9. *Number of parties that did or did not use POPs before the Convention and those currently using or not using POPs.*



280. 133 out of 180 parties (74%) reported that they used POPs pesticides before 2001, 27 parties (15%) indicated ongoing use, and 61 parties (34%) reported that POPs pesticides are no longer used in their countries. 92 Parties have not reported on whether or not they have ongoing use.

281. PCB was the main industrial chemical used before 2001 and currently being used.116 out of 180 parties (64%) reported that they used industrial chemicals before 2001 and almost the same set of parties had ongoing use.

282. PCB has been used in many countries as electrical transformer oils, dielectric fluids, electrical capacitors, heat transfer fluids, hydraulic fluids, solvent extenders, flame retardants, plasticisers, some paints and printing inks, immersion oils and sealants. The Stockholm Convention provides that the Parties shall make determined efforts to identify, label and remove from use equipment and liquids containing PCB by 2025 and to manage waste liquids and equipment containing PCB in an environmentally sound manner by 2028. PCB in open applications (e.g. cable-sheaths, cured caulk and painted objects) should also be identified and managed in accordance with paragraph 1 of Article 6. The available information suggests that many parties are still struggling with meeting those goals set for PCB in the Convention. The information on the progress made in elimination of PCB has been collected as part of the process for the evaluation pursuant to part II of Annex A. Please refer to the subsection on PCB for more information.

Outcome indicator 3: For each chemical listed in Annexes A and B, changes in quantities imported or exported for environmentally sound waste disposal

283. Information on quantities imported or exported for environmentally sound waste disposal is scarce. Among all POPs, PCB and DDT were most often exported for final disposal. The destinations included Finland, France, Germany, Netherlands, Poland, Spain, Switzerland and United Kingdom. Most of the reported exports of POPs for final disposal were from developing countries or countries with economies in transition. A larger quantity of PCB has been exported to developed countries for final disposal, compared to pesticides (mainly DDT). Additional information is provided in section II.B.3 of this report (Article 6).

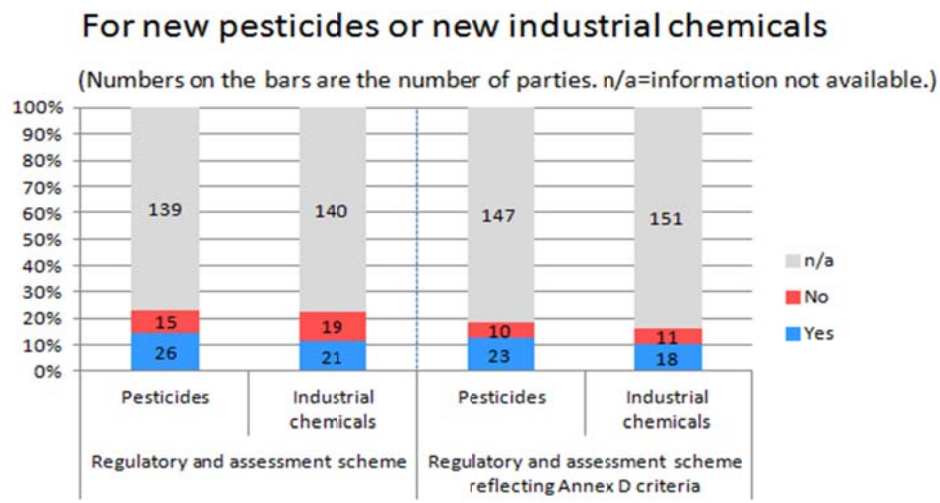
Process indicator 4: The number of parties with regulatory and assessment schemes for new pesticides and/or new industrial chemicals

284. Paragraph 3 of Article 3 states that "Each Party that has one or more regulatory and assessment schemes for new pesticides or new industrial chemicals shall take measures to regulate with the aim of preventing the production and use of new pesticides or new industrial chemicals which, taking into consideration the criteria in paragraph 1 of Annex D, exhibit the characteristics of persistent organic pollutants."

285. New pesticides and new industrial chemicals mentioned in this paragraph are the pesticides and industrial chemicals that have not been placed on the market.

286. The number of parties having one or more regulatory and assessment schemes for new pesticides or new industrial chemicals is shown in Figure B.1.10.

Figure B.1.10. *Number of parties that have or have not one or more regulatory and assessment schemes for new pesticides or new industrial chemicals*



287. According to the information collected by the POPs Review Committee and presented in Figure B.1.10,[30] 26 of 180 parties (14%) responded that they have regulatory and assessment schemes for new pesticides, of which 88% responded that the schemes took into consideration the criteria in paragraph 1 of Annex D.

288. For new industrial chemicals, 21 of 180 parties (12%) responded that they have regulatory and assessment schemes, of which 78% responded that the schemes took into consideration the criteria in paragraph 1 of Annex D.

289. Due to the low submission rate, the information was not available from 77-84% of parties. However, it is worth noting that a high percentage of regulatory and assessment schemes reflected the criteria in Annex D to prevent the production and use of new pesticides and new industrial chemicals which exhibit the characteristic of POPs.

[30] UNEP/POPS/COP.5/INF/9.

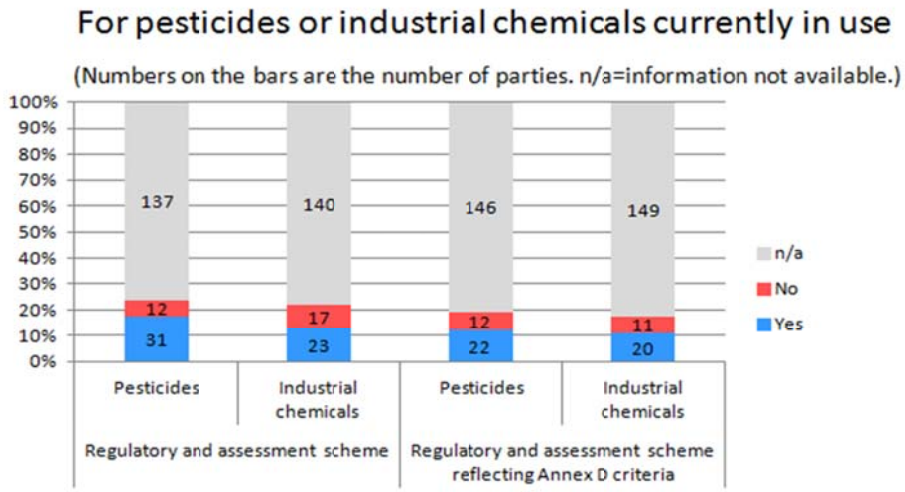
290. In the third national reports, parties are asked whether they had taken measures to regulate new pesticides or new industrial chemicals with the aim of preventing the production and use of new chemicals that exhibit the characteristics of persistent organic pollutants, taking into consideration the criteria in paragraph 1 of Annex D. 38 of 77 parties (49%) indicated that they had taken such measures. 14 parties took such measures before 2001, 15 parties between 2001 and 2008, 8 parties after 2009 and 1 party did not specify the year.

291. Paragraph 4 of Article 3 states that "Each Party that has one or more regulatory and assessment schemes for pesticides or industrial chemicals shall, where appropriate, take into consideration within these schemes the criteria in paragraph 1 of Annex D when conducting assessments of pesticides or industrial chemicals currently in use".

292. Pesticides and industrial chemicals currently in use are the pesticides and industrial chemicals that have been registered and placed on the market.

293. The number of parties that have one or more regulatory and assessment schemes for pesticides or industrial chemicals currently in use is shown in Figure B.1.11.

Figure B.1.11. *Number of parties that have or have not one or more regulatory and assessment schemes for pesticides or industrial chemicals currently in use*



294. 31 of 180 parties (17%) responded that they have regulatory and assessment schemes for pesticides currently in use, of which 71% responded that the schemes took into consideration the criteria in paragraph 1 of Annex D.

295. For industrial chemicals currently in use, 23 of 180 parties (13%) responded that they have regulatory and assessment schemes, of which 87% responded that the schemes took into consideration the criteria in paragraph 1 of Annex D.

296. The number of parties that have regulatory and assessment schemes were slightly higher for pesticides or industrial chemicals currently in use than that for new pesticides or industrial chemicals.

(d) Main findings

Measures to control production, import, export and use of persistent organic pollutants

297. According to the information contained in the NIPs and in the national reports, a majority of Parties (up to 66% depending on the chemical) provided information on having set up measures, including legal and administrative measures, to control the production, import, export and use of POPs listed in Annexes A and B that meet or exceed the Convention's requirements, either before or upon entry into force of the Convention. The percentage of Parties that have implemented measures for the newly listed POPs (21-34%) is lower than that for the legacy POPs (54-66%).

298. According to the information from the NIPs, many Parties have environmental legislation covering hazardous chemicals or pesticides in general, but not specifically the listed POPs. Many of these Parties have not submitted national reports to confirm whether they have developed or revised their regulatory framework and legislation to address listed POPs after transmitting their NIPs.

299. More Parties have implemented legal and administrative measures to control pesticides than industrial chemicals. For legacy POPs, the highest percentage was reported for DDT (65%) and the lowest for PCB (54%). The rate for PCB is lower than for other chemicals, despite the fact that PCB are one of the most widespread industrial POPs across the globe. For the newly listed POPs, the highest percentage was reported for lindane (35%) and the lowest for PFOS, its salts and PFOSF (20%).

Production, use, import and export for use

300. A decrease in the production, use, export and import was observed for most of the POPs except for PCB, DDT, endosulfan, lindane, and PFOS, its salts and PFOSF. Among the newly listed POPs, Parties reported production, export and import of lindane, endosulfan, pentachlorobenzene, tetra and pentaBDE and PFOS, its salts and PFOSF. Most of the production and use of the initial POPs ceased before 2004, except for PCB and DDT. More than 60% of Parties reported past and ongoing use of PCB. A number of Parties (17 Parties listed in the Register) still have a need for DDT for disease vector control.

301. Even though the majority of the production of POPs pesticides ceased before 2004 and exports and imports have been banned, legacy POPs pesticides are reported to exist as obsolete stocks. Several Parties indicated in their NIPs that obsolete stockpiles of such substances may be illegally used by farmers. Mislabelling or a lack of appropriate labels (for example, because products sold to farmers are repackaged by warehouse staff) are cited as reasons for such illegal use.

302. Some Parties, in particular developing country Parties, indicated that import and use of POPs are banned but there may be illegal trafficking of POPs pesticides with unknown quantities. Indications are also provided that the naming of pesticides used among farmers is often not consistent with the official name. Some POPs pesticides are used as mixtures and the users may not be aware of the contents.

Import and export for environmentally sound waste disposal

303. Information on quantities imported or exported for environmentally sound waste disposal is scarce. Among all POPs, PCB and DDT were most often exported for final disposal. Most of the reported exports of POPs for final disposal were from developing country Parties or Parties with economies in transition to developed country Parties.

Regulatory and assessment schemes for new pesticides and/or new industrial chemicals

304. A limited number of Parties report regulatory and assessment schemes for new pesticides and/or new industrial chemicals (more for pesticides, 14%, than for industrial chemicals, 12%). Most of the regulatory and assessment schemes take in to account the criteria in Annex D; thus they ideally would prevent production and use of new pesticides or new industrial chemicals that have the characteristics of POPs.

(e) Conclusions and recommendations

305. The increase observed in 2010 and 2012 in the number of Parties that have implemented measures for newly listed chemicals, even though not universal, provides evidence that the entry into force of an amendment for a particular chemical is a trigger for some but not all Parties to amend and implement administrative or legal measures to control the production, use, import and export of the chemical.

306. Many Parties, in particular developing country Parties, provide information in their NIPs on having general environmental legislation covering hazardous chemicals or pesticides, but fewer have legislation and/or regulations specifically designed to implement obligations regarding listed POPs. The percentage of Parties that have implemented measures for the newly listed POPs (21-34%) is lower than that for the legacy POPs (54-66%).

307. Measures to control pesticides are more widespread than for industrial chemicals. In particular, measures to control PCB are lacking in a number of countries, in particular in developing country Parties and Parties with economies in transition.

Recommendation: *Priority attention should be given to developing, enforcing and/or strengthening national legislation and/or regulations implementing the Convention that are appropriate for both industrial chemicals and pesticides. For legacy POPs, this recommendation is especially important for developing country Parties and Parties with economies in transition, in order to control in particular industrial chemicals, with regard to their import, export and use. For the newly listed POPs, this recommendation is equally important for all Parties regardless of their economic situation. Parties need to develop or revise their national legislation and/or regulations to specifically implement obligations regarding POPs listed under the Convention.*

308. Quantitative information on the production of POPs reported by Parties is extremely limited, such that it is not possible to discuss trends. However, according to the NIPs, most production of legacy POPs ceased before 2004.

Recommendation: *Further development of national inventories should be encouraged among Parties to provide a mechanism for a quantitative global inventory of production, stocks and releases of POPs. Furthermore, modelling and cooperation with other chemical management initiatives should be encouraged as these approaches would contribute to a transparent and reliable global inventory which could then provide useful information on changes over time.*

309. Most of the production and use of the legacy POPs ceased before 2004, except for PCB and DDT. Past and ongoing use of PCB is still widely reported. At the current rate of activity, obligations in the Convention related to 2025 and 2028 will not likely be met by most Parties.

Recommendation: *Parties, which have not already done so, should be vigorously encouraged to implement legal and administrative measures to meet the obligations of the Stockholm Convention related to 2025 and 2028 for the elimination and environmentally sound management of PCB.*

310. Although production of all legacy POPs pesticides (except DDT) ceased before 2004 and all exports and imports were banned thereafter, large stockpiles exist in some Parties that are developing countries and countries with economies in transition and may be illegally used by farmers. These illegal uses may result in an ongoing risk to human health and the environment.

Recommendation: *All Parties should urgently develop inventories of stockpiles and manage them in an environmentally sound manner as required by Article 6. Enactment and enforcement of national legislation and/or regulations is key to this endeavour. Key in developing country Parties in particular is education for farmers about the health and environmental risks of banned pesticides.*

311. Illegal trafficking of POPs pesticides and ambiguity as to the commercial names and the composition of the mixtures in use make sound management of the banned pesticides difficult, especially for Parties that are developing countries and countries with economies in transition.

Recommendation: *Customs officers should receive more harmonized training on POPs pesticides identification and national obligations pertaining to the Stockholm Convention. Users of POPs pesticides and industrial chemicals should be made more aware of their risks and safe handling practices as a further means of reducing illegal trafficking.*

312. Production and/or export and import of several newly listed POPs continue, in particular for lindane, endosulfan, pentachlorobenzene, tetra- and pentaBDE, hexa- and heptaBDE and PFOS, its salts and PFOSF.

Recommendation: *Information on the current use of these chemicals and alternatives should be collected and shared through the Stockholm Convention information sharing and reporting mechanisms in order to accelerate their replacement and reduce their ongoing use.*

313. Information on import is much more limited than that collected on production and export. Further, reports from those exporting a substance to a country did not match the import records of the receiving country.

Recommendation: *Parties should provide validated information on production, import and export of POPs, including quantitative information, in the national reports required pursuant to Article 15.*

314. Among all POPs, PCB and DDT are exported for final disposal in the largest amounts. Taking into account the information related to ongoing use of PCB and DDT, it is probable that these chemicals will continue to be exported for final disposal for several years.

Recommendation: *Exports of DDT and PCB for final disposal should be closely monitored through the use of data gathered through the DDT questionnaire, national reporting under Article 15 of the Stockholm Convention and national reporting under the Basel Convention, in particular for the evaluation of the progress made towards the elimination of PCB as required by the Convention.*

315. While significant progress has been made to control intentional production and/or use of POPs, more remains to be done. Among the legacy POPs, DDT and PCB remain a major concern along with ongoing production and/or use of some newly listed POPs that are still on the market.

Recommendation: *The Secretariat should continue to undertake activities to raise awareness of the obligations of the Convention with respect to the POPs listed in Annexes A and B and provide guidance and assistance for Parties to effectively implement control measures.*

DDT

(a) Available information

Relevant COP decision

SC-1/25: DDT	Adopts the format of the DDT register
SC-2/2: DDT	Adopts on an interim basis the process for the reporting assessment and the evaluation of the continued use of DDT for disease vector control
SC-3/2: DDT	Adopts the revised process for DDT reporting, assessment
SC-7/2: DDT	Endorses the key elements of the road map for the development of alternatives to DDT

316. In addition to the information channels specified in paragraph 39 above (namely the first, second, and third national reports and the national implementation plans), several other data sources were used, in particular the completed country responses to the DDT Questionnaire which parties, who produce or use DDT for disease vector control are required to complete and submit to the Secretariat of the Stockholm Convention once every three years[31]. Five cycles of questionnaire data were available for analysis. The DDT questionnaires provided useful data on DDT production, use, import and export for use.

317. Additional sources were consulted to add or verify data. These data sources were reports from the DDT Expert Group and the Global Alliance on Alternatives to DDT, publications of the World Health Organization (WHO), GEF documents and published articles.

318. While this section addresses primarily production and use under acceptable purposes for vector disease control, additional information on the production and use of DDT as a closed-system site-limited intermediate in the production of dicofol as a specific exemption is provided in section II.C.1 of this report.

(b) Analysis of available information and application of the framework

National-level measures

319. Legal measures governing the production, import, export and use of DDT are in place in the majority of countries. The current status as reported by countries shows 64% of parties with a production prohibition on DDT, 74% with an import prohibition, and 82% with a prohibition on agriculture use (Table B.1.2). Prohibition on public health use is less common, because a number of parties continue to accept the use of DDT for disease vector control. A reporting bias, with lower reporting rates among resource-poor countries, cannot be ruled out.

320. When comparing the situation on legal measures ‘before 2001’with ‘from 2001’, it is evident that major progress has been made since the Convention was adopted. Out of the countries with legal measures in place, roughly half of them have developed or amended these measures since 2001. The progress was most significant during the initial years, 2001-2004.

[31] http://chm.pops.int/Implementation/DDT/DDTQuestionnaires/tabid/266/Default.aspx

Table B.1.2. *Number (and%) of countries that have established legal measures to control the production, import, export and use of DDT (n = 108 responding parties). A sub-division is given to identify the date of establishment or amendment of the measures. Some parties did not indicate the date.*

Legal measures on DDT	Total	Before 2001	From 2001				Date not indicated
			2001-2004	2005-2008	2009-2012	Sub-total	
1 Production prohibition	69 (64%)	30	20	3	8	31 (29%)	8
2 Import prohibition	80 (74%)	28	23	6	8	37 (34%)	15
3 Export prohibition	63 (58%)	24	24	4	5	33 (31%)	6
4 Prohibition on agriculture use	89 (82%)	37	20	6	7	33 (31%)	19
5 Prohibition on public health use	73 (68%)	34	15	5	7	27 (25%)	12
6 Restriction according to Annex B	44 (41%)	8	17	8	1	26 (24%)	10

321. Despite the progress made, the implementation of legal measures remains a major challenge. WHO has highlighted critical shortcomings in how countries with endemic vector-borne diseases are regulating, managing and monitoring public health pesticides (which include DDT), particularly in the WHO African Region (WHO 2011). These shortcomings will undermine the effectiveness and safety of public health pesticides (PLoS Medicine 2015). Illegal trafficking and use of DDT in sectors other than health has been reported or suspected by several parties, although the term was not defined. To help parties address these deficiencies for DDT, a toolkit has recently been developed to assist parties in strengthening the sound management of DDT through its 'life-cycle' stages (UNEP 2015).

DDT Register

322. A Register for acceptable purposes in relation to DDT has been established in accordance with the provisions of Annex B of the Stockholm Convention. This allows parties to report their production or use of DDT, or their intention to produce or use in the future. The number of parties in the DDT Register is indicative of progress made in implementation of the Stockholm Convention.

323. In December 2015, 17 parties were listed in the Register (Table B.1.3). Not all of those listed are current users of DDT, because some parties have indicated that they want to reserve the option for reverting back to the use of DDT when needed, which could be in the case of disease outbreaks or in case of resistance in vector populations against available insecticides other than DDT. Botswana, for example, has indicated its intention to revert to DDT if the country is invaded from neighbouring countries by the malaria vector that is only susceptible to DDT. Two parties, Gambia and Zimbabwe, are not registered, even though they are known users of DDT.

Table B.1.3. *Register for acceptable purposes of production and use of DDT. Status in December 2015.*

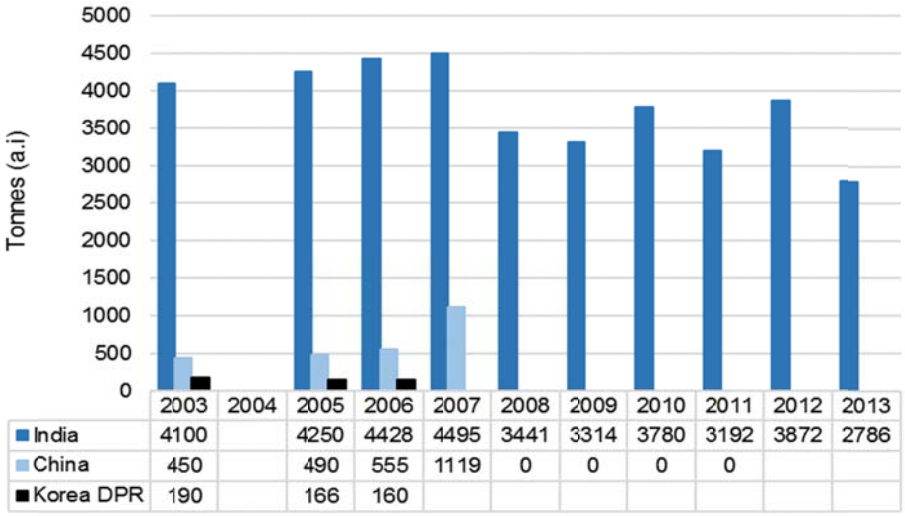
Party	Production notification	Use notification
1 Botswana		2004
2 Eritrea		2010
3 Ethiopia	2006	2006
4 India	2006	2006
5 Madagascar		2007
6 Marshall islands		2004
7 Mauritius		2007
8 Morocco		2005
9 Mozambique		2007
10 Namibia	2009	2009
11 Senegal		2006
12 South Africa		2004
13 Swaziland		2006
14 Uganda		2008
15 Venezuela		2009
16 Yemen		2005
17 Zambia		2008

Production

324. Since the Stockholm Convention entered into force, there have been only three known producers of DDT: India, China and DPR Korea (Figure B.1.12)[32].Average production during the period 2003-2008 was 4768 tonnes p.a., but production declined during the period 2009-2013 to 3389 tonnes p.a.—a decline of 29%.

325. India has been the largest producer of DDT, and its production is still continuing. China discontinued its production in 2008. Data from DPR Korea are available for the period 2003-2006, but not thereafter, and therefore it is possible that its production is still continuing.

Figure B.1.12. *Estimated global production of DDT (excluding DDT used as intermediate in the production of Dicofol, and use as additive in anti-fouling paints). Blank spaces indicate missing data; data for 2004 are lacking.*



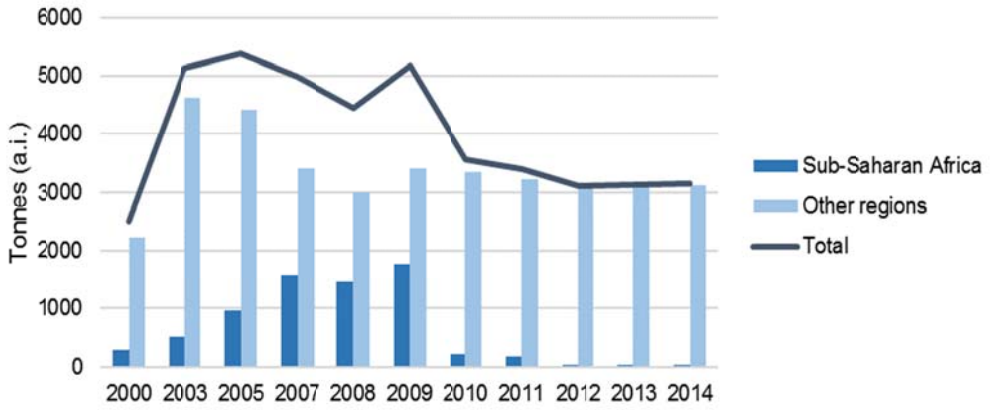
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
India	4100		4250	4428	4495	3441	3314	3780	3192	3872	2786
China	450		490	555	1119	0	0	0	0		
Korea DPR	190		166	160							

[32] The national reports suggest that Mexico produced a large quantity of DDT in 2004, but this information probably refers to the period before 2001 because other sources report that Mexico eliminated the use of DDT for malaria control in 2000 (*Int. J. Hyg. Environ. Health* 206, 387-394, 2003).

Use

326. The global use of DDT has shown a slow but gradual decline from an average annual use of 5034 tonnes active ingredient (a.i.) (2003-2009) to an average of 3268 tonnes a.i. (2010-2014), which is a 35% decline (Figure B.1.13). In Sub-Saharan Africa, the use of DDT increased until 2009, but declined thereafter[33]. In Sub-Saharan Africa, the increase in DDT use was associated with the increase in indoor residual spraying for malaria control, and the decline after 2009 is largely attributable to national policy change away from DDT due to the observed resistance in malaria vectors to DDT in several countries. The use in Sub-Saharan Africa was a minor part of the global use.

Figure B.1.13. *Historical trend in the use of DDT*



327. The reported amounts of DDT used by individual countries are presented in Table B.1.4. Clearly, India stands out as the main user of DDT, responsible for 83% of global use on average. In recent years, India is responsible for an estimated 96-97% of global use (mindful that some countries have not yet reported on their use in 2012-2014). Hence, the slow decline in global use is to a large extent due to the slow decline of use in India.

Table B.1.4. *Annual use of DDT (in tonnes of a.i.) by individual countries. Blue shades indicate periods in which the continued use of DDT is known or presumed; dash indicates zero-use. 0 indicates 'less than 0.5t'; open space indicates missing data. The year in which countries became party to the POPs Convention is indicated. Data sources are DDT questionnaires and other UNEP reports.*

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Bangladesh	30							[a]							
Botswana			[a]							0	6	0			
Ecuador	2				[a]										
Eritrea		7	6	13		15[a]		15		10	14	17	0	0	0
Ethiopia	267	274	299	272[a]		398		1200	1200	1350	0	0	0		
Gambia				0		0	[a]	0		16	11	11			
Guyana	48	0	0					[a]							
India	2131			4444		4253	[a]	3413	3000	3415	3347	3223	3090	3090	3110
Korea, DPR			[a]	190	179	166	160								
Madagascar		0	60	40	30	0[a]	0	0	0	0	0	0	0	0	0
Mauritius		1	1	1	1[a]	1	1	2	3	0	1	0	0	0	0
Morocco		0	0	1	0[a]	0		0	0	0	0	0	0	0	0
Mozambique				0		308[a]		201	143	300	150	98	0	0	12
Myanmar	9	7	1	1	[a]	1							0	0	0
Namibia				40		40[a]		56							
South Africa	12	11	5[a]	54	62	65	75	73	59	64	16	47	24	30	18
Sudan		75	75	75			[a]	0							
Swaziland						8	[a]	8		4	4	4			
Uganda				0	[a]	0	0	0	24	0	0	0			
Venezuela	1	0	0			[a]									
Zambia				7		26	[a]	23	33	24	19	0	0	0	0
Zimbabwe				0		108		12					[a]		
Total	2499			5137		5387		5002	4462	5182	3567	3399	3114	3120	3140

[a] Year of ratification, acceptance, approval or accession of the Stockholm Convention

[33] Gambia, Namibia, Swaziland and Zimbabwe have not reported on their use of DDT in 2012-14. This is estimated to be 60-100 tonnes of DDT(a.i.) used per year.

328. The second largest user of DDT has been Ethiopia, which had its own national formulation facility for DDT, but in 2009 this country adopted a policy change away from DDT; this policy change was in response to high reported levels of DDT resistance in the malaria vectors. In 2011, Eritrea and Zambia followed suit, mostly for the same reason of insecticide resistance.

329. India, Namibia, South Africa and Swaziland are long time users of DDT that continue to use DDT to date. Other countries that continue to use DDT are Zimbabwe, and since more recently, Gambia. Mozambique has used DDT in moderately large amount amounts but discontinued after a policy change in 2011. However, it has reported new import and use of DDT in 2014, which is possibly in response to the problem of resistance against other vector control insecticides (Malaria Journal 2011).

330. As reported in the NIP, DPR Korea used DDT mainly in agriculture and forestry (91-97% of DDT used); the remainder was used in public health (NIP). No recent data on use are available from DPR Korea.

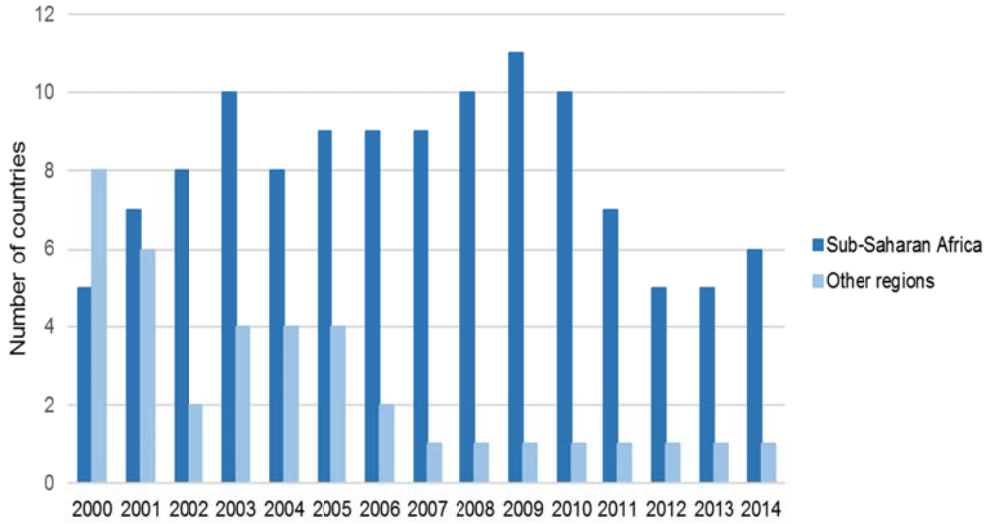
331. Whilst Table B.1.4presents data obtained through UNEP's national focal points in the ministry of environment, Table B.1.5 presents independent data obtained through WHO's national focal points in the ministry of health. The comparison between the two tables is useful because it provides triangulation of the data collected. In general, the tables show differences in figures, and on average 11% higher global use in the WHO data, but in the main the results seem quite robust.

Table B.1.5. *Data on annual use of DDT (in tonnes of a.i.) collected externally by WHO. A dash indicates zero-use; 0 indicates 'less than 0.5t'; open space indicates missing data (WHO 2010).*

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Bangladesh	36	-	-	-	-	-	-	-	-	-
Ecuador	2	-	-	-	-	-	-	-	-	-
Eritrea	4	8	8	-	8	12	16	27	31	12
Ethiopia	321	335	366	336	311	327	406	710	1,445	781
Guyana	-	0	-	-	-	-	-	-	-	-
India	3,087	4,893	4,274	5,244	5,268	5,092	3,731	3,479	4,107	4,000
Madagascar	23	-	55	56	37	-	-	-	-	-
Mauritius	1	2	1	1	1	1	0	1	1	0
Mozambique		-	-	-	-	366	82	124	352	104
Myanmar	10	8	1	3	2	2	1	0.2	0.2	0.2
Namibia		53	95	48	31	48	61	88	23	92
Solomon Islds.	-	2	1	0.3	1	0.1	-	-	-	-
South Africa			13	6	76	70	70	78	77	70
Swaziland						9	8	7	7	7
Thailand	27	4	-	-	-	-	-	-	-	-
Uganda							-	-	29	-
Venezuela	1	-	-	-	-	-	-	-	-	-
Zambia					11	42	-			
Zimbabwe	-	-	-	-	-	96	61	44	97	61
Total	3,512	5,305	4,814	5,693	5,745	6,065	4,436	4,558	6,170	5,127

332. The total number of DDT-using countries fluctuated between 10-14 in the period from 2000-2010, but after 2010, there have been only 6-8 DDT-using countries. It should be restated that India, as single country, accounted for most of the global use of DDT.

Figure B.1.14. *Estimated number of countries that used DDT over the period 2000-2014. A sub-division is made between countries in sub-Saharan Africa and in the rest of the world (other regions).*



333. The number of DDT-using countries showed an increase in Sub-Saharan Africa, versus a decrease in other regions (FigureB.1.14). Factors that lead African countries to revert to DDT were problems with resistance against alternative vector control insecticides, as well as the establishment of new IRS programmes in African countries.

334. In this respect, it is important to highlight the developments that led to the exemption in the Convention for the continued use of DDT for disease vector control. In 1996, South Africa had withdrawn DDT from its malaria control programme in Northern Kwazulu/Natal, switching to a pyrethroid insecticide instead, but this policy change had a negative outcome. Soon afterwards, malaria incidence rates increased sharply, and entomological investigations revealed that the culprit, a very efficient vector species, had re-invaded the country after DDT spraying had stopped and was highly resistant to the pyrethroids being used (Med. & Vet. Entomol. 2000). Reverting back to use of DDT was considered as the only viable option. Other countries in the region were closely observing the developments in South Africa; several of them were confronted with similar problems of resistance and later on they also reverted to the use of DDT.

335. Major malaria control efforts on the African continent included the establishment and expansion of IRS programmes; this generated demand for DDT in a number of countries.

336. After 2010, several African countries discontinued using DDT, mostly because recent capacity building on monitoring of insecticide resistance had revealed high levels of resistance to DDT. For Uganda, one of the driving forces to discontinue DDT use one year after it was introduced was the anticipated negative implications of DDT use for the export of agricultural crops. This may have been a factor preventing some other countries to revert to DDT use.

Import for use

337. Twelve African countries have reported import of DDT for use in their malaria control programmes (Table B.1.6). South Africa reported almost annual imports of DDT, which is because it has a chemical facility at which the imported technical-grade DDT is formulated and re-packaged for national use and for export to other countries in Africa. Ethiopia also had a formulation facility for DDT, but production was discontinued in 2009. Ethiopia, Namibia and Swaziland did not report on their imports of DDT.

Table B.1.6. *Annual import of DDT (tonnes a.i.) for use in disease vector control by individual countries. All data (except from Zimbabwe) from DDT questionnaires.*

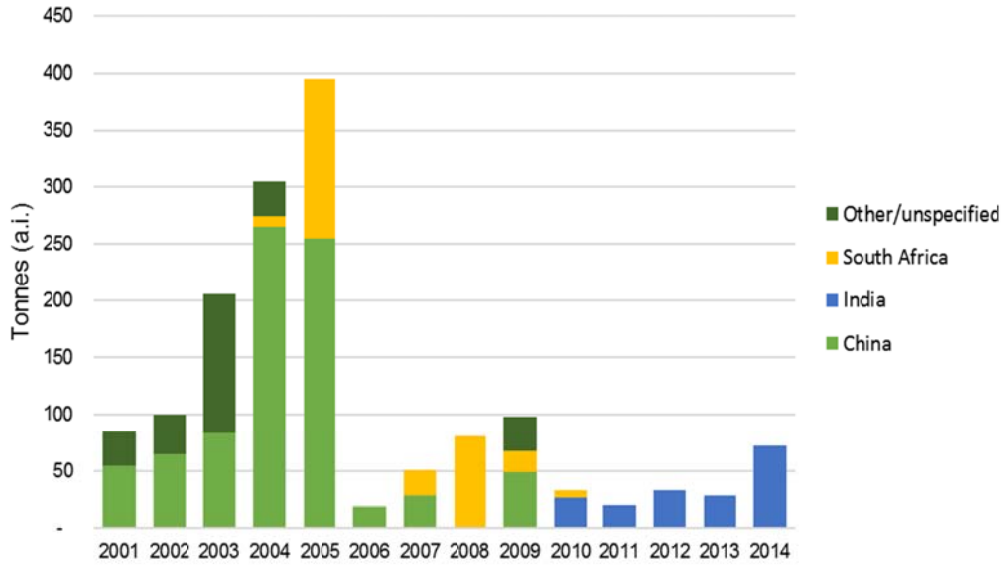
Country	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Botswana									0	7					7
Eritrea			0						31	26					57
Gambia									30		1				31
Madagascar			45	30											75
Mozambique														55	55
South Africa	55	65	57	265	255	19	28		19		18	33	28	18	860
Sudan	30	35	76												141
Uganda								48							48
Zambia							23	33	18						74
Zimbabwe[a]				10	140										150

[a] Data from UNEP reports

338. The global import of DDT for use in disease vector control shows an increase from 2001-2005, but imports declined to much lower levels in recent years (FigureB.1.15). Import of DDT was predominantly from manufacturing facilities in India and China and from the formulation facility in South Africa[34]. Hence, the same product may feature twice in these data, by first travelling from the manufacturer to the formulator in South Africa, and then from South Africa to the end-users elsewhere in Africa.

339. Up until 2009, all imports originated from China (or unspecified sources). After China discontinued its production of DDT in 2008, it also stopped its export after 2009. From 2010 onwards, imports originated solely from India.

Figure B.1.15. *Annual global import of DDT for use in malaria control, indicating the origin of the product.*



[34] Eritrea reported that in 2009 it imported 30.5 tonnes a.i. of DDT from Switzerland.

Export for use

340. Data on export of DDT, for use in disease vector control, from China, India and South Africa are summarized in Table B.1.7. Clearly, the data on import and export do not tally. For example, the total reported amounts exported were more than three times higher than the total reported amounts imported. Also, the years of export do not seem to match the years of import.

Table B.1.7. *Annual global export of DDT (tonnes a.i.) from China, India and South Africa to countries for use in disease vector control.*

Year	From China to:	t	From India to:	t	From South Africa to:	t
2002	Unspecified	448				
2006	Namibia, Ethiopia,	693	Mozambique, Eritrea	323	Zimbabwe	50
	South Africa		Eritrea	1	Swaziland	4
					Zambia	28
					Namibia	38
2007	Korea, Ethiopia,	707	Mozambique	460	Zimbabwe	28
	South Africa		Gambia	6	Swaziland	11
					Zambia	30
					Namibia	3
2008	Ethiopia, Eritrea	1,501	Mozambique	124	Zambia	33
					Uganda	48
					Zimbabwe	38
2009			Mozambique	124	Zambia	18
			Namibia	12	Swaziland	4
					Botswana	0
2010			Unspecified	24	Zambia	7
					Namibia	75
					Swaziland	3
2011			Unspecified	319	Swaziland	3
Total		3,348		1,392		421

Export for disposal

341. Data on export for final disposal were obtained from several sources (Table B.1.8), but this list is likely to be incomplete. For some of the listed countries (e.g. Iran, Jordan, Mauritius and Morocco) the disposal was carried out in the context of GEF projects. Destinations of the exports for disposal were predominantly countries in Europe. To put these data of export into perspective, they must be compared vis-à-vis the obsolete stocks of DDT that still remain in individual countries.

Table B.1.8. *Available data on export of DDT for final disposal*

Country	Year	Destination	Tonnes (a.i.)	Source[a]
Colombia	2009	Finland	167.5	2
Honduras	2000	Netherlands	150.0	2
Honduras	2014	UK	60.0	2
Iran	2015	France	28.7	3
Jordan	2013	France	23.8	3
Macedonia	2006	Switzerland	2.3	2
Macedonia	2011	Switzerland	4.3	2
Mauritius	2013	France	139.0	4
Morocco	2014	France	42.5	3
Nepal	2011	Germany	2.3	1
New Zealand	2004-09	France	?	2
Peru	2004	Germany	3.0	2
Peru	2011	Germany	3.0	2
Uganda	2010	South Africa?	?	1

[a] 1, DDT questionnaires; 2, national reports; 3,WHO reports; 4, UNDP reports

Import for disposal

342. Australia was the only country reporting on its import of DDT for final disposal (Table B.1.9). None of the countries listed as destination in Table B.1.9 have reported on their import of the consignments. This demonstrates an inconsistency in the date reported by parties pursuant to Article 15.

Table B.1.9. *Available data on import of DDT for final disposal*

Country	Year	Origin	Tonnes (a.i.)
Australia	2006	Fiji; Nuie	0.1
Australia	2007	Solomon Islands	2.2
Australia	2008	Vanuatu	1.3

(c) Main findings

343. Legal measures governing the production, import, export and use of DDT are in place in the majority of Parties. Out of that number, roughly half of them have developed or amended these measures since 2001, indicating major progress due to the Convention. Nevertheless, there are indications that the implementation of legal measures, through pesticide life-cycle management, remains a major challenge in vector-borne disease endemic countries.

344. Global production of DDT declined by 29%, from 4768 tonnes of active ingredient (a.i.) per year in 2003-2008, to 3389 tonnes a.i. per year in 2009-2013. India is the only known remaining producer.

345. Global use of DDT has declined by 35% from 5034 tonnes a.i. per year in 2003-2009 to 3268 tonnes a.i. per year in 2010-2014. India has been the main user of DDT, responsible for 83% of global use in 2000-2014; in recent years, India has been responsible for an estimated 96-97% of global use. India uses DDT for control of malaria and leishmaniasis.

346. The use of DDT for malaria control in Sub-Saharan Africa has been relatively minor as compared to the use in India. Especially, in recent years, the use in Africa is estimated to be less than 100 tonnes a.i. per year; a small fraction of the global use.

347. A number of African countries have alternately discontinued and resumed use of DDT as a result of several contemporary developments, notably the up-scaling of vector control interventions, which included indoor residual spraying with DDT and the development and monitoring of insecticide resistance in malaria vectors.

348. However, insecticide resistance in malaria vectors is sweeping across Africa. This is reducing the choice of readily available insecticidal options for malaria vector control. In southern Africa, in particular, the main malaria vectors have become resistant to both pyrethroids and carbamates. This leaves only DDT and much more expensive organophosphates as immediate options for insecticidal control and for insecticide resistance management. Alternative vector control methods included in the Handbook for Integrated Vector Management (IVM) of the World Health Organization (WHO), such as house improvement and larval source management, deserve increased attention in future IVM strategies.

349. Regarding the import and export of DDT, global import for use in disease vector control shows an increase from 2001-2005, but imports reduced to much lower levels in recent years. Data on import and export do not tally and require more consistent reporting by Parties. A number of countries reported export of DDT for final disposal; destinations were mostly countries in Europe. Reporting on import for final disposal has been poor.

(d) Conclusions and recommendations

350. In several African countries, recent capacity building on entomological surveillance and insecticide susceptibility monitoring has prompted a timely policy change away from the use of DDT. The effectiveness of the Stockholm Convention towards achieving its global objectives regarding DDT could be further improved by focusing efforts to reduce the current high levels of DDT use in some countries. Indications of increased use of DDT for leishmaniasis control and the spread of emerging vector borne health threats point to the need for adoption of more integrated vector control methods and more education about the benefits for local communities of reducing reliance on DDT, and in developing safer, technically feasible, accessible, more effective and affordable non-POPs alternatives.

Recommendation: *Further capacity building is needed to improve entomological surveillance, evidence-based decision making and fine-tuned targeting of vector control interventions that would reduce the use of DDT. Integrated vector management which will lead to substantial benefits for the global environment should be encouraged.*

351. The road map for the development of alternatives to DDT (the key elements of which were endorsed by the Conference of the Parties at its seventh meeting)[35] provides the required framework for using safer alternatives than continued use of DDT.

Recommendation: *Further support is needed for the development of safer, effective and affordable alternatives to DDT and for strengthening the capacity of Parties still relying on DDT to commence a sustainable transition away from DDT.*

352. Data on import and export of DDT contained in national reports do not match. Data on import for final disposal are especially poor.

Recommendation: *Existing reporting mechanisms for DDT should be improved so that the data can be used for the specific requirements for effectiveness evaluation under the Convention, particularly the mechanism for reporting on export and import of DDT for use in disease vector control or for final disposal. In addition, collaboration with the Basel Convention's reporting system related to imports and exports for final disposal and the WHO's reporting system on public health pesticides in relation to DDT should be explored.*

Polychlorinated biphenyls (PCB)

(a) Available information

Relevant COP decision

SC-6/6: Polychlorinated biphenyls	Welcomes the decision by the United Nations Environment Programme to accept the leadership of the Polychlorinated Biphenyls Elimination Network
SC-7/3: Polychlorinated biphenyls	Takes note of the preliminary assessment of efforts made towards the elimination of polychlorinated biphenyls developed by the United Nations Environment Programme in cooperation with the Secretariat and in consultation with the advisory committee of the Polychlorinated Biphenyls Elimination Network and encourages parties to intensify efforts to eliminate polychlorinated biphenyls and meet the goals of the Stockholm Convention

353. At its seventh meeting, the Conference of the Parties took note of the preliminary assessment of efforts made toward the elimination of PCB conducted by UNEP, in cooperation with the Secretariat and in consultation with the advisory committee of the PCB Elimination Network (UNEP/POPS/COP.7/INF/9). The preliminary assessment included, among others, the information on the production and use of PCB, amounts of PCB eliminated to date, amounts of PCB still to be eliminated, and recommendations on the elimination of PCB.

354. In decision SC-7/3, the Conference of the Parties requested the Secretariat to consolidate the preliminary assessment in accordance with the framework for the effectiveness evaluation and to make it available, by 31 January 2016, to the effectiveness evaluation committee and to submit the report to the Conference of the Parties for consideration at its eighth meeting. The analysis below summarizes the findings of the consolidated assessment.

Guidance documents

355. The following guidance documents and guidelines have been developed by relevant bodies of the Stockholm and Basel conventions, UNEP Chemicals Branch, and the Intergovernmental Forum on Chemical Safety as part of technical assistance activities to support parties meeting their obligations:

(a) Updated technical guidelines for the environmentally sound management of wastes consisting of, containing or contaminated with polychlorinated biphenyls (PCB), polychlorinated terphenyls (PCTs) or polybrominated biphenyls (PBBs), including hexabromobiphenyl (HBB) (UNEP/CHW.12/5/Add.5/Rev.1, 2015);

[35] UNEP/POPS/COP.7/INF/6; UNEP/POPS/COP.7/5, annex II.

(b) Guidelines for the identification of PCB and materials containing PCB (UNEP Chemicals Branch, August 1999);

(c) PCB inventory form (UNEP Chemicals Branch, August 2002);

(d) PEN magazine – inventories of PCB (PCB Elimination Network, November 2010);

(e) Polychlorinated biphenyls inventory guidance (PCB Elimination Network, June 2013,);

(f) PCB transformers and capacitors from management to reclassification and disposal (UNEP Chemicals Branch, May 2002);

(g) Framework for the management of PCB (IFCS, February 2001);

(h) Preparation of a national environmentally sound management plan for PCB and PCB-contaminated equipment (Secretariat of the Basel Convention, March 2003);

(i) Inventory of world-wide PCB destruction capacity (UNEP Chemicals Branch, December 2004);

(j) Survey of currently available non-incineration PCB destruction technologies (UNEP Chemicals Branch, August 2000);

(k) Destruction and decontamination technologies for PCB and other POPs wastes under the Basel Convention (Secretariat of the Basel Convention, October 2002);

(l) PCB in open applications, identification and environmentally sound management (PCB Elimination Network, July 2014).

(b) Consolidated assessment of efforts made towards the elimination of PCB

356. According to the consolidated assessment of efforts made toward the elimination of PCB (UNEP 2016), it is estimated that between 1 and 1.5 million tonnes of technical grade PCB have been produced. The assessment estimates that each tonne of technical grade PCB generated at least 20 tonnes of waste containing or contaminated with PCB at the relevant concentrations. Production has been limited to a small number of countries (12) and companies (17).

357. Commercial production started around 1929 and has progressively been phased out in the second half of that century. Most sources suggest that production ended in 1993; however, according to its NIP, the Democratic People's Republic of Korea (DPRK) continued producing PCB at least until 2006. Information received during the fifth and sixth meetings of the Advisory Committee of the PCB Elimination Network (PEN) suggest that the DPRK continues to produce PCB.

358. PCB has mainly been used in electrical equipment, in particular in transformers. The estimated distribution of PCB use is as follows: 48% for transformer oil; 21% for small capacitors; 21% in open applications and 10% for other closed system applications.

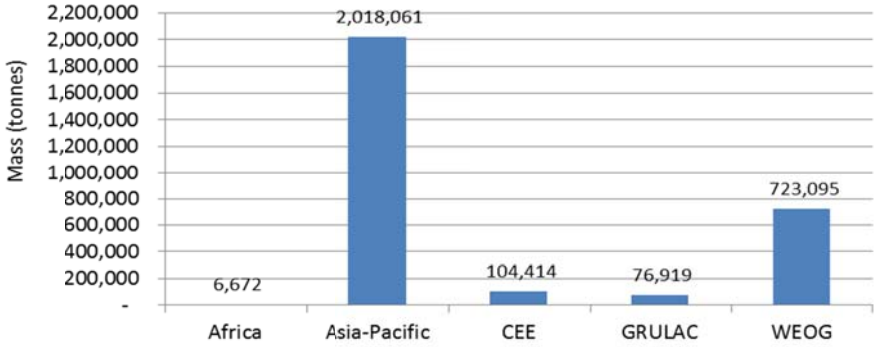
Progress made in elimination of PCB

359. According to the data provided in the first, second and third national reports, the total eliminated mass of liquids and equipment containing or contaminated with PCB at concentrations greater than 0.005% amounts and volumes greater than 0.05 litres amount to approximately 628,000 tonnes (first report: approx. 359,000; second report: approx. 108,000; third report: approx. 162,000 tonnes). However, there is a high probability that a share of the total is due to double counting. Nonetheless, the data obtained from the national reports are likely to be an underestimation due to a number of reasons e.g. low response rates, different units used in reporting, incomplete inventories.

360. Taking into account all other sources of information available, the amount of liquids and equipment containing or contaminated with PCB eliminated by the Parties to the Stockholm Convention to date is estimated at approximately 3 million tonnes. Expert judgment suggests that the actual amounts eliminated are much higher, most notably because quantitative data was not available for a large number of countries. It is important to note that Japan reported about two thirds of the amounts already eliminated. According to UNEP (2016), expert judgment suggests that this is an additional indication that other countries reported numbers that were significantly too low.

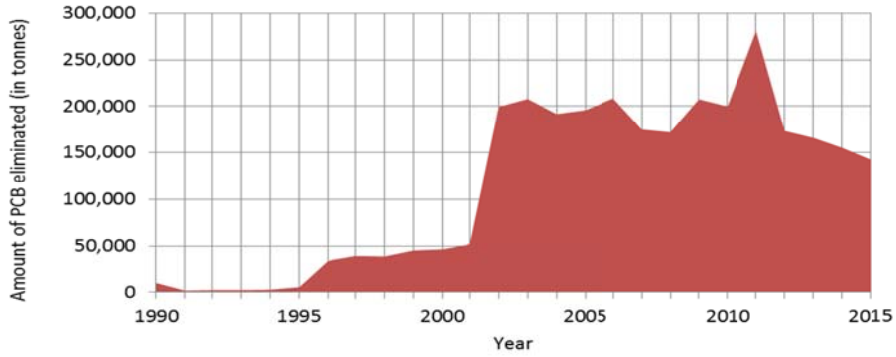
361. Figure B.1.16 shows the origin of the total mass eliminated by region. Approximately 68 % of the total amount eliminated is from the Asia-Pacific Region. The WEOG follows with approximately723,000 tonnes (approximately 24 %). Relatively small amounts eliminated to date are from other regions. In eliminating PCB liquids and equipment, regions followed different approaches: While the WEOG and the Asia-Pacific Region relied mostly on domestic elimination or export for elimination within the region, CEE, Africa and GRULAC relied largely on exports outside of the respective regions.

Figure B.1.16. *Origin of total mass eliminated by region*



362. The yearly trends in the eliminated mass of PCB (tonnes/year) between 1990 and 2015 are shown below. According to available data, approx. 70 % of the total was eliminated after 2004. The largest amounts were reported to have been eliminated in 2011. The data suggest that increasing amounts were eliminated in the years leading up to the Convention's entry into force and thereafter. The data should be viewed with caution due to biased reporting: Many countries' national reports provide data from 2001 onwards.

Figure B.1.17. *Total mass eliminated between 1990 and 2015*



363. As of January 2015, the GEF project database lists a total of 46 projects related to PCB elimination (42 national projects: 6 completed, 18 under implementation, 18 in preparation; 3 regional projects: 2 under implementation, 1 in preparation). Total funding of USD 171 million has been allocated by the GEF for those projects and co-financing of USD 459 million has been leveraged. Quantitative data were available for 33 of these projects, with a total amount of GEF-grants at approx. USD 124 million and co-financing at approx. USD 323 million. Available data suggests that as part of these projects, approx. 23 thousand tonnes have been eliminated, while another 65 thousand tonnes are scheduled for elimination. Elimination was among the objectives in four out of the six projects reported as completed. These four projects received GEF grants at a total of approx. USD 21 million and had co-financing amounting to about USD 17 million. In total, these projects reportedly eliminated 12,657 tonnes of liquids and equipment containing or contaminated with PCB.

Amount of PCB still to be eliminated

364. According to available information, the amount of PCB liquids and equipment that still need to be eliminated is estimated to be about 14 million tonnes, most of which is found in transformers. Information on other applications including, in particular open applications, is inadequate to draw any conclusions. It is highly probable, that the actual amounts still to be eliminated are much larger: Most inventories are only preliminary in nature and focus on few sectors and the main categories. They also typically do not cover open applications.

365. A closer look at the data reported by Parties reveals that most of the amounts have been reported by Japan. As previously noted, Japan provided a very comprehensive and detailed inventory. Removing Japan from the data set decreases the total mass still to be eliminated to approx. 2.5 million tonnes. the high figures reported by Japan should be seen as an indication that most, if not all other countries reported quantities that are unrealistically low, meaning that the total mass still to be eliminated is probably much larger than the estimated 14 million tonnes.

366. The regional distribution of the amount of PCB in equipment that still needs to be eliminated is shown below. For this purpose, Japan was removed from the data set. Notwithstanding this, the Asia-Pacific region still accounts for the largest share, namely approx. 34 %, followed by CEE and GRULAC at approx. 19 %, WEOG at approx. 17 % and Africa at approx. 11 %.

367. In summary, the global estimation based on the available information is that approximately 17 % (3 million tonnes) of the total amount of PCB contaminated waste and fluids has been eliminated to date and about 83 % (14 million tonnes) remain to be destroyed. Within each region, the percentage of the progress made towards elimination of PCB is estimated as follows: African region: 2 %; Asia-Pacific Region: 14%; GRULAC: 14 %; CEE: 19 %, WEOG: 64% (Table B.1.10).

Table B.1.10. *Estimates of the progress made towards elimination of PCB per UN region*.

Region	Eliminated		To be eliminated		Total
	Tonnes	Share (%)	Tonnes	Share (%)	
Africa	6,056	2	269,736	98	275,792
Asia-Pacific	2,017,916	14	12,374,821	86	14,392,736
CEE	111,009	19	482,076	81	593,085
GRULAC	76,772	14	484,768	86	561,540
WEOG	744,267	64	415,464	36	1,159,731
All	2,956,019	17	14,026,865	83	16,982,885

(c) Main findings

368. An estimated 1 to 1.5 million tonnes of technical grade PCB have been produced, with each tonne of technical grade PCB having generated at least 20 tonnes of waste containing or contaminated with PCB at relevant concentrations.[36]

369. The amount of liquids and equipment containing or contaminated with PCB eliminated by the Parties to the Stockholm Convention to date is estimated at approximately 3 million tonnes. Actual amounts eliminated could be much higher, most notably because quantitative data was not available for a large number of countries. Approximately 70% of the progress in elimination was made after the entry into force of the Convention in 2004.[37]

370. The amount of PCB liquids and equipment that still need to be eliminated is estimated to be about 14 million tonnes, most of which is found in transformers. Information on other applications including, in particular open applications, is limited. It is highly probable, at least in part due to low reporting rates, that the actual amounts still to be eliminated are much larger. Currently no mechanism is available under the Convention to review and monitor progress in implementation of the PCB provisions.

371. The amounts already disposed of and scheduled for disposal under the global environmental facility (GEF) projects is very small compared to the estimated total amounts still to be eliminated. Given the large amounts that still need to be eliminated, it is necessary to increase the cost-effectiveness of interventions by designing projects in a way as to strengthen human and infrastructure capacities in the long term, beyond the duration of the project.

372. Technologies and capacities for the elimination or irreversible transformation of PCB are available, with many countries already having eliminated substantial amounts of PCB either domestically or via export.

(d) Conclusions and recommendations

373. The Stockholm Convention, through the development of NIPs, as well as the many GEF-funded projects, had a beneficial impact on raising awareness of PCB, building national capacity and in eliminating PCB-containing liquids and equipment, but progress toward PCB elimination is slow. While some progress has been made towards the elimination of PCB, the majority of Parties are

[36] UNEP/POPS/COP.8/INF/10.

[37] Ibid.

currently not on track to identify, label and remove from use equipment and liquids containing PCB by 2025 and to manage waste liquids and equipment containing PCB in an environmentally sound manner by 2028 and the number of tonnes remaining to be disposed of globally is daunting. A strong argument can be made that the scope of the challenge of achieving the elimination of use of PCB by 2025 and the environmentally sound management of PCB by 2028 has been severely underestimated at least in part due to poor reporting.

Recommendation: *There is a need, in particular for developing country Parties and Parties with economies in transition, to strengthen their national or regional capacities for the elimination or irreversible transformation of PCB congeners and formulations.*

Recommendation: *Parties should urgently define rigorous plans for the environmentally sound management of PCB throughout its life cycle, including its elimination and destruction, and explore the optimal and most cost-effective solutions given the specific background and circumstances of each individual country.*

374. Most national inventories of PCB are preliminary in scope and provide a fragmented picture. Even for closed applications, comprehensive data are often lacking. Currently no mechanism is available under the Convention to review progress in implementation of the PCB provisions.

Recommendation: *PCB inventories need to be undertaken in a systematic manner, in accordance with the existing guidance, and cover all types of equipment, sectors and geographical areas. Each Party should ensure that their national reports contain comprehensive, clear, reliable and well-structured data on the amounts of PCB already eliminated and, most importantly, the amounts still to be eliminated. It may be useful to establish a mechanism under the Convention to review progress in PCB elimination.*

375. The costs of eliminating the large amounts of PCB which remain are significant. Despite the current level of financing to this issue, substantial additional funding will be necessary to eliminate and destroy the amounts of PCB in use or stored if the objective of the Convention is to be met.

Recommendation: *GEF projects should be designed to strengthen human and infrastructure capacities for PCB elimination and destruction which will last beyond the duration of the project. Initiatives to manage PCB in an environmentally sound manner should also be designed to develop sustainable infrastructure, processes and techniques that can be used for the transportation, storage and destruction of other hazardous wastes particularly POPs wastes.*

Hexabromodiphenyl ether and heptabromodiphenyl ether (hexa- and heptaBDE), tetrabromodiphenyl ether and pentabromodiphenyl ether (tetra- and pentaBDE)

(a) Available information

Relevant COP decisions and processes[38]

SC-4/19: Establishing indicative elements of a work programme to facilitate the elimination of listed brominated diphenyl ethers and the restriction or elimination of perfluorooctane sulfonic acid and its salts, perfluorooctane sulfonyl fluoride and other chemicals listed in Annexes A or B of the Convention at the fourth meeting of the Conference of the Parties	Decides to undertake a work programme to provide guidance to Parties on how best to restrict and eliminate brominated diphenyl ethers, perfluorooctane sulfonic acid (PFOS) and its salts, perfluorooctane sulfonyl fluoride (PFOSF) and other chemicals listed in Annexes A or B
SC-5/5: Work programme on brominated diphenyl ethers and perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride	Encourages parties and other relevant stakeholders to implement where appropriate, taking into account national circumstances, the recommendations set out in the annex to decision POPRC-6/2 on the elimination from the waste stream of brominated diphenyl ethers that are listed in Annex A to the Convention and on risk reduction for perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride
SC-6/3: Process for the evaluation of	Adopts the process to enable the Conference of the

[38] Relevant decisions listing new substances in Annexes A or B to the Convention are listed in section II.C.2 of this report. Relevant decisions on exemptions are listed in section II.C.1 of this report.

progress parties have made towards eliminating brominated diphenyl ethers contained in articles and the review of the continued need for specific exemptions for those chemicals	Parties to evaluate the progress that parties have made towards achieving their ultimate objective of elimination of brominated diphenyl ethers listed in Annex A to the Convention and to review the continued need for the specific exemption for those chemicals in accordance with paragraph 2 of parts IV and V of that Annex
SC-6/7: Work programme on brominated diphenyl ethers and perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride	Requests the Secretariat to prepare a report highlighting challenges that may be encountered by parties in implementing the recommendations
SC-7/4: Revised format for the submission of information for the evaluation and review of brominated diphenyl ethers pursuant to paragraph 2 of parts IV and V of Annex A to the Stockholm Convention	Takes note of the information provided by parties on their experience in implementing the recommendations set out in the annex to decision POPRC-6/21 and the report by the Secretariat on the main challenges encountered by parties in implementing the recommendations with regard to brominated diphenyl ethers listed in Annex A to the Convention and decides to take them into account in the evaluation and review at its eighth meeting pursuant to paragraph 2 of parts IV and V of Annex A to the Convention

Guidance documents

376. The following guidance documents and guidelines have been developed by relevant bodies of the Stockholm and Basel conventions as part of the technical assistance activities to support parties meeting their obligations:

(a) Guidance on flame retardant alternatives to pentabromodiphenyl ether (UNEP/POPS/POPRC.4/INF/13);

(b) Revised draft guidance on best available techniques and best environmental practices for the recycling and waste disposal of articles containing polybrominated diphenyl ethers listed under the Stockholm Convention (UNEP/POPS/COP.7/INF/22);

(c) Revised draft guidance for the inventory of polybrominated diphenyl ethers under the Stockholm Convention (UNEP/POPS/COP.7/INF/27);

(d) Basel Convention technical guidelines for the environmentally sound management of wastes consisting of, containing or contaminated with hexabromodiphenyl ether and heptabromodiphenyl ether, and tetrabromodiphenyl ether and pentabromodiphenyl ether (UNEP/CHW.12/5/Add.6/Rev.1).

Implementation of the recommendations on elimination of BDEs from the waste stream

377. Following the listing of new chemicals, by its decision SC-4/19, the Conference of the Parties decided to undertake a work programme to provide guidance to Parties on how best to restrict and eliminate BDEs, PFOS, its salts and PFOSF and other chemicals listed in Annexes A or B at the fourth meeting.

378. The outcomes of the work programme related to BDEs were the technical review of the implications of recycling commercial pentaBDE and commercial octaBDE (UNEP/POPS/POPRC.6/2/Rev.1 and UNEP/POPS/POPRC.6/INF/6), compilation of information submitted by parties and observers in response to the request set out in decision SC-4/19 (UNEP/POPS/POPRC.6/INF/5), recommendations by the POPs Review Committee on the elimination of BDEs from the waste stream (decision POPRC-6/2, part I), and the key findings and gaps identified by the Committee in the submissions by parties and observers (UNEP/POPS/POPRC.6/13, annex II, part I).

379. By its decision SC-5/5, the Conference of the Parties took note of the recommendations set out in decision POPRC-6/2 and encouraged parties and others to implement them. The information on the experiences of parties in implementing the recommendations is summarized in annex I to document UNEP/POPS/COP.6/10 and compiled in documents UNEP/POPS/COP.6/INF/7 and UNEP/POPS/COP.7/INF/12. The main challenges encountered by parties in implementing the recommendations are reported in the annex IV to document UNEP/POPS/COP.7/8.

Evaluation pursuant to paragraph 2 of parts IV and V of Annex A

380. By decision SC-6/3, the Conference of the Parties adopted the process for the evaluation of progress parties have made towards eliminating BDEs contained in articles and the review of the continued need for specific exemptions for those chemicals,[39] pursuant to paragraph 2 of parts IV and V of Annex A. The annex to decision SC-7/4 contains the revised format for the submission of information for the evaluation. After the first evaluation at its sixth meeting, the Conference of the Parties concluded that countries may still need to make use of the exemption for BDEs listed in Annex A to the Convention in accordance with the provisions of parts IV and V of that annex.

(b) Analysis of available information and application of the framework

Parties having submitted notifications for register of specific exemptions for BDEs

381. As at 30 April 2016, 6 parties had submitted notifications for the register of specific exemptions for the use of hexabromodiphenyl ether and heptabromodiphenyl ether and 7 parties for tetrabromodiphenyl ether and pentabromodiphenyl ether, as summarized in the table below.

Table B.1.11. *Parties submitted notifications for register of acceptable purposes for BDEs*

Chemical	Parties registered for use
Hexabromodiphenyl ether and heptabromodiphenyl ether	Brazil, Canada, Czech Republic, European Union, Iran, Japan
Tetrabromodiphenyl ether and pentabromodiphenyl ether	Brazil, Canada, Czech Republic, European Union, Iran, Japan, Vietnam

Production

382. According to the risk profile and risk management evaluation on commercial pentaBDE (tetra- and penta-BDE) (UNEP/POPS/POPRC.2/17/Add.1, UNEP/POPS/POPRC.3/20/Add.1), total global demand has decreased from 8,500 tonnes in 1999 to 7,500 tonnes in 2001. The estimated cumulative use of commercial pentaBDE since 1970 was 100,000 tonnes in 2001 according to the Bromine Science and Environmental Forum, a trade association of companies in the brominated flame retardant industry. Commercial pentaBDE has been produced in Israel, Japan, US and the EU. Since 2001 actions to regulate or voluntarily phase-out commercial pentaBDE have been conducted in several countries.

383. According to the risk profile and risk management evaluation on commercial octaBDE (hexa- and hepta-BDE) (UNEP/POPS/POPRC.3/20/Add.6, UNEP/POPS/POPRC.4/15/Add.1), the estimated annual world-wide production of commercial octaBDE in 1994 was 6,000 tonnes which decreased to 3,800 tonnes by 2001. The production was phased out in the EU, Norway, Switzerland, Canada and the USA in the early to mid 2000's. There is no information that indicates production of commercial octaBDE in developing countries.

384. As hexa- and heptBDE and tetra- and pentaBDE are listed with no specific exemptions for production, no quantitative information on production was reported in the national reporting.

[39] In accordance with part IV of Annex A, a party may allow recycling of articles that contain or may contain hexabromodiphenyl ether and heptabromodiphenyl ether, and the use and final disposal of articles manufactured from recycled materials that contain or may contain hexabromodiphenyl ether and heptabromodiphenyl ether, provided that, among others, the party has notified the Secretariat of its intention to make use of this exemption. A similar specific exemption is available for tetrabromodiphenyl ether and pentabromodiphenyl ether in accordance with part V of Annex A. In accordance with paragraph 2 of both part IV and V of Annex A, the specific exemption shall any case expire at the latest in 2030.

Use

385. The polybrominated diphenyl ethers in general are used as flame retardants of the additive type. The most common use, accounting for 95-98% of C-PentaBDE since 1999, has been in polyurethane foam (Hale et al. 2002). This foam may contain between 10 and 18% of the commercial pentaBDE formulation. Polyurethane foam is mainly used for furniture and upholstery in domestic furnishing, automotive and aviation industry. Other uses are in rigid polyurethane elastomers in instrument casings, in epoxy resins and phenolic resins in electrical and electronic appliances, and construction materials.

386. In light of the ban and phase-out of commercial pentaBDE and commercial octaBDE, the availability of practicable and economically viable substitutes for their uses has been demonstrated in practice.

Implementation of the recommendations on elimination of BDEs from the waste stream and progress parties have made towards eliminating BDEs

387. Only 12 parties responded to the questionnaire to collect information for the evaluation of progress parties have made towards eliminating BDEs. According to the report, 5 parties responded that they have taken actions or control measures to eliminate hexa- and heptaBDE and/or tetra- and pentaBDE contained in articles and 3 parties have taken measures to implement the recommendations on the elimination of BDEs from the waste stream set out in decision POPRC-6/2, or any other actions.

388. Two parties have put in place screening and separation techniques for wastes containing BDEs and 3 parties have implemented measures to ensure that recycling and final disposal of articles containing BDEs are carried out in an environmentally sound manner. Four parties have taken any measures to prevent the export of articles from recycling pursuant to Part IV and/or Part V, 1b of Annex A.

389. Several parties reported that currently there is a lack of information on environmentally sound disposal and recycling operations for BDEs. One party reported that it has conducted a study on the existence of BDEs in products and recycling processes. The result indicated that the materials containing BDEs are mainly in electrical and electronic equipment and cars and that those are sufficiently regulated by existing legislation. Another party reported that it has not conducted any study to identify products containing BDEs in recycling processes. Several parties reported that there is no effective screening technique for BDEs in products.

390. This issue is of high relevance in both industrialized and developing regions. According to a report published by UNEP in 2011, several challenges are noted for African countries in connection with e-waste management and subsequent contamination with PBDEs. Specific challenges in the region are related to the control of used electric and electronic equipment imports, collection strategies and sound technological recycling solutions, as well as support through policy, economic instruments, and legislation (UNEP 2011). However, in 2015 the Basel Convention adopted interim technical guidelines on e-waste and guidelines on the environmentally sound disposal, storage and export of waste material containing BDEs to guide parties on the environmentally sound management of both of these waste streams.

(c) Main findings

391. Limited information has been provided on the progress Parties have made towards eliminating BDEs. Several Parties report that currently there is a lack of information on environmentally sound disposal and recycling operations for BDEs. According to one study on the existence of BDEs in products and recycling processes, the materials containing BDEs are mainly in electrical and electronic equipment and cars.

392. The main challenges identified at the seventh meeting of the Conference of the Parties in the elimination of BDEs include: information gaps related to the life cycle of BDEs (in particular for imported products); a paucity of studies to identify the presence of BDEs in products and recycling processes; understanding the activities taking place at waste management and recycling facilities and identifying best management practices; the task of separation of BDEs from the wastes fraction; and, the lack of effective techniques for the screening of BDEs in the waste stream.[40]

[40] UNEP/POPS/COP.7/8, annex IV.

(d) Conclusions and recommendations

393. To date, limited information has been reported by Parties on progress made towards eliminating BDEs. The specific exemption for the recycling of BDEs listed in Annex A is available until 2030 at the latest, and the second evaluation of the progress that Parties have made towards eliminating BDEs and the review of the continued need for the specific exemptions will take place at the eighth meeting of the Conference of the Parties.

Recommendation: *In order to evaluate the progress made in elimination of BDEs, Parties and observers should provide quantitative information on articles containing BDEs, including in recycling and waste streams.*

Recommendation: *The guidance documents made available at the seventh meeting of the Conference of the Parties should be completed in consultation with the Basel Convention so that they can be used widely to develop more comprehensive inventories of BDEs and help with the application of best available techniques and best environmental practices for the recycling and waste disposal of articles containing BDEs.*

Perfluorooctane sulfonic acid (PFOS), its salts and perfluorooctane sulfonyl fluoride (PFOSF)

(a) Available information

Relevant COP decisions and processes[41]

SC-4/19: Establishing indicative elements of a work programme to facilitate the elimination of listed brominated diphenyl ethers and the restriction or elimination of perfluorooctane sulfonic acid and its salts, perfluorooctane sulfonyl fluoride and other chemicals listed in Annexes A or B of the Convention at the fourth meeting of the Conference of the Parties	Decides to undertake a work programme to provide guidance to Parties on how best to restrict and eliminate brominated diphenyl ethers, perfluorooctane sulfonic acid (PFOS) and its salts, perfluorooctane sulfonyl fluoride (PFOSF) and other chemicals listed in Annexes A or B
SC-5/5: Work programme on brominated diphenyl ethers and perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride	Encourages parties and other relevant stakeholders to implement where appropriate, taking into account national circumstances, the recommendations set out in the annex to decision POPRC-6/2 on the elimination from the waste stream of brominated diphenyl ethers that are listed in Annex A to the Convention and on risk reduction for perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride
SC-6/4: Process for the evaluation of the continued need for perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride for the various acceptable purposes and specific exemptions	Adopts the process set out in the annex to the present decision to enable the Conference of the Parties to undertake the evaluation of perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride in accordance with paragraphs 5 and 6 of part III of Annex B to the Convention
SC-6/7: Work programme on brominated diphenyl ethers and perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride	Requests the Secretariat to prepare a report highlighting challenges that may be encountered by parties in implementing the recommendations
SC-7/5: Evaluation of perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride pursuant to paragraphs 5 and 6 of part III of Annex B to the Convention	Concludes that parties may need to continue to produce and/or use perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride for acceptable purposes as provided in Annex B to the Convention and consequently need to notify the Secretariat of their intention to produce and/or use those chemicals for those purposes and encourages parties to consider, on the basis of information and the availability of alternatives, withdrawing their names

[41] Relevant decisions listing new substances in Annexes A or B to the Convention are listed in section II.C.2 of this report. Relevant decisions on exemptions are listed in section II.C.1 of this report.

	from the register of acceptable purposes for production and use of perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride

Guidance documents

394. In response to the request in decision SC-5/5, the POPs Review Committee developed a technical paper on the identification and assessment of alternatives to the use of PFOS in open applications (UNEP/POPS/POPRC.8/17/Rev.1) and developed recommendations on the basis of the technical paper (decision POPRC-8/8).

395. In addition, the following guidance documents and guidelines have been developed by relevant bodies of the Stockholm and Basel conventions:

(a) Guidance on alternatives to PFOS, its salts, PFOSF and their related chemicals (UNEP/POPS/POPRC.9/INF/11/Rev.1);

(b) Revised draft guidance on best available techniques and best environmental practices for the use of PFOS and related chemicals listed under the Stockholm Convention (UNEP/POPS/COP.7/INF/21);

(c) Revised draft guidance for the inventory of PFOS and related chemicals listed under the Stockholm Convention (UNEP/POPS/COP.7/INF/26);

(d) Technical guidelines for the environmentally sound management of wastes consisting of, containing or contaminated with PFOS, its salts and PFOSF (UNEP/CHW.12/5/Add.3/Rev.1).

Implementation of the recommendations on the risk reduction for PFOS, its salts and PFOSF

396. Following the listing of new chemicals, by its decision SC-4/19, the Conference of the Parties decided to undertake a work programme to provide guidance to Parties on how best to restrict and eliminate BDEs, PFOS, its salts and PFOSF and other chemicals listed in Annexes A or B at the fourth meeting.

397. The outcomes of the work programme related to PFOS, its salts and PFOSF were the compilation of information submitted by parties and observers in response to the request set out in decision SC-4/19 (UNEP/POPS/POPRC.6/INF/5), recommendations by the POPs Review Committee on the risk reduction for PFOS, its salts and PFOSF (decision POPRC-6/2, part II), and the key findings and gaps identified by the Committee in the submissions by parties and observers (UNEP/POPS/POPRC.6/13, annex II, part II).

398. By its decision SC-5/5, the Conference of the Parties took note of the recommendations set out in decision POPRC-6/2 and encouraged parties and others to implement them. The information on the experiences of parties in implementing the recommendations is summarized in annex I to document UNEP/POPS/COP.6/10 and compiled in documents UNEP/POPS/COP.6/INF/7 and UNEP/POPS/COP.7/INF/12. The main challenges encountered by parties in implementing the recommendations are reported in the annex IV to document UNEP/POPS/COP.7/8.

Evaluation pursuant to paragraphs 5 and 6 of part III of Annex B

399. By its decision SC-6/4, the Conference of the Parties adopted the process for the evaluation of the continued need for PFOS, its salts and PFOSF fluoride for the various acceptable purposes and specific exemptions, pursuant to paragraphs 5 and 6 of part III of Annex B.

400. For the first evaluation at the seventh meeting of the Conference of the Parties, the POPs Review Committee prepared a report on the assessment of alternatives to PFOS, its salts and PFOSF (UNEP/POPS/POPRC.10/INF/7/Rev.1) and factsheets on alternatives to PFOS, its salts and PFOSF (UNEP/POPS/POPRC.10/INF/8/Rev.1) and the Secretariat prepared a report for the evaluation of information on PFOS, its salts and PFOSF (UNEP/POPS/COP.7/INF/11). The conclusion of the Conference of the Parties on the first evaluation is set out in decision SC-7/5.

(b) Analysis of available information and application of the framework

Parties having submitted notifications for register of acceptable purposes and specific exemptions for PFOS, its salts and PFOSF

401. As at 30 April 2016, 11 parties had submitted notifications for the register of acceptable purposes for the production or use of PFOS, its salts and PFOSF as summarized in the table below. In its decision SC-7/5, the Conference of the Parties concluded that parties may need to continue to produce and/or use PFOS, its salts and PFOSF for acceptable purposes as provided in Annex B to the Convention and consequently need to notify the Secretariat of their intention to produce and/or use those chemicals for those purposes.

Table B.1.12. *Parties that submitted notifications for register of acceptable purposes for PFOS, its salts and PFOSF*

Acceptable purposes	Parties registered for production	Parties registered for use
Photo-imaging	China, European Union, Japan, Vietnam	Canada, China, Czech Republic, European Union, Japan, Norway, Switzerland, Vietnam
Photo-resist and anti-reflective coatings for semi-conductors	China, European Union, Japan, Vietnam	Canada, China, Czech Republic, European Union, Japan, Norway, Switzerland, Vietnam
Etching agent for compound semi-conductors and ceramic filters	China, European Union, Japan, Vietnam	Canada, China, European Union, Japan, Norway, Switzerland, Vietnam
Aviation hydraulic fluids	China, European Union, Vietnam	Canada, China, Czech Republic, European Union, Norway, Switzerland, Vietnam, Zambia
Metal plating (hard metal plating) only in closed-loop systems	China, European Union, Vietnam	Canada, China, Czech Republic, European Union, Norway, Switzerland, Vietnam
Certain medical devices (such as ethylene tetrafluoroethylene copolymer (ETFE) layers and radio-opaque ETFE production, in-vitro diagnostic medical devices, and CCD colour filters)	China, Japan, Vietnam	China, Japan, Vietnam, Vietnam
Fire-fighting foam	China, Vietnam	Canada, China, Switzerland, Zambia
Insect baits for control of leaf-cutting ants from *Atta spp.* and *Acromyrmex spp.*	Brazil, Vietnam	Brazil, Vietnam

402. As at 30 April 2016, 10 parties had submitted notifications for the register of specific exemptions for the production or use of PFOS, its salts and PFOSF as summarized in Table B.1.13 below. In its decision SC-7/1, the Conference of the Parties noted that as there were no longer any parties registered for the specific exemptions for the production and use of PFOS, its salts and PFOSF for carpets, leather and apparel, textiles and upholstery, paper and packaging, coatings and coating additives and rubber and plastics, no new registrations may be made with regard to them.

403. In accordance with paragraph 4 of Article 4, the registrations of specific exemptions expired for opt-out (most) Parties five years after the date of entry into force of the amendment with respect to PFOS, its salts and PFOSF that entered into force for those parties in August 2010.[42]As at 30 April 2016, China[43]is the only party registered for specific exemptions for the production and use of PFOS, its salts and PFOSF for the following items: photo masks in the semiconductor and liquid crystal display industries, electric and electronic parts for some colour printers and colour copy machines, insecticides for control of red imported fire ants and termites, and chemically driven oil production. For the specific exemptions for the use of PFOS, its salts and PFOSF for metal plating (hard metal plating) and metal plating (decorative plating), China and Brazil have registered specific exemptions.

Table B.1.13. *Parties' submitted notifications for register of specific exemptions for PFOS, its salts and PFOSF*

Specific exemptions	Production	Use
Photo masks in the semiconductor and liquid crystal display (LCD) industries	China, Vietnam	Canada, China, Norway, Vietnam
Metal plating (hard metal plating)	China, European Union, Vietnam	Brazil, Canada, China, Czech Republic, European Union, Iran, Switzerland, Vietnam
Metal plating (decorative plating)	China, European Union, Vietnam	Brazil, Canada, China, European Union, Iran, Switzerland, Vietnam
Electric and electronic parts for some colour printers and colour copy machines	China, Vietnam	China, Vietnam
Insecticides for control of red fire ants and termites	China, Vietnam	China, Vietnam
Chemically driven oil production	China, Vietnam	China, Iran, Nigeria, Vietnam
Carpets	Vietnam	Iran, Nigeria, Vietnam
Leather and apparel	Vietnam	Iran, Nigeria, Vietnam
Textiles and upholstery	Vietnam	Iran, Nigeria, Vietnam
Paper and packaging	Vietnam	Iran, Nigeria, Vietnam
Coatings and coating additives	Vietnam	Iran, Nigeria, Vietnam
Rubber and plastics	Vietnam	Iran, Nigeria, Vietnam

Production

404. The global production of PFOSF by 3M, the main producer of the chemical until the production ceased in 2003, is estimated to have been 13,670 metric tonnes (1985 to 2002), with the largest yearly production volume, 3700 metric tonnes of PFOS and PFOS related substances, in 2000. On 16 May 2000, 3M announced that the company would phase-out the manufacture of PFOS and PFOS-related substances voluntarily from 2001 onwards. By the end of 2000, about 90% of 3M's production of these substances had stopped and in the beginning of 2003 the production ceased completely. Quantitative data on production have only been available from 3M so far, but it is considered that the combined capacity of the other producers was very much less than that of 3M.

[42] The amendment to the Convention listing PFOS, its salts and PFOSF in Annex B to the Convention entered into force for most parties on 26 August 2010.

[43] China had made a declaration in accordance with paragraph 4 of Article 25.The amendment to the Convention listing PFOS, its salts and PFOSF in Annex B to the Convention entered into force for China on 26 March 2014.

Use

405. The European Union Scientific Committee on Health and Environmental Risks notes that use of PFOS and PFOS related substances in consumer applications such as carpets, leather/apparel, textiles/upholstery, paper and packaging, coatings, industrial and PFOS household cleaning products, pesticides and insecticides has been largely abandoned following the announcement of the main global producer to phase out manufacture and use of PFOS consumer applications. Uncertainty however remains as to the current levels of use taking into account the limited quantitative data available.

406. In the photo-imaging sector, photographic films continue to disappear and the present use is practically limited to special products. Further, new techniques have been developed which do not require PFOS in photolithographic procedures.

407. In photo-resist and anti-reflective coatings for semi-conductors, PFOS free technology has been reported; however, for reasons of confidential business information, the alternate photo-resist chemistry could not be disclosed. Replacement of PFOS has been achieved through a variety of means including the use of shorter-chain compounds (C-4 to C-1 carbon chains), the use of non-fluorinated substitutes and the elimination of the surfactant function within the photo-resist. Information from other parties points to the industry, together with suppliers, working on PFOS-free solutions; however industry asserts that more time is needed to develop a full range of qualitatively comparable alternatives.

408. The use of PFOS in hydraulic fluids seems to be outdated. It has been replaced by other fluorinated compounds. The hydraulic fluids existed before PFOS was industrially available and the oil based fluids might be an alternative. A hazard-based assessment of the alternatives has been conducted by the POPs Review Committee, based on an analysis as to whether or not the identified chemical alternatives meet the numerical thresholds in Annex D of the Convention (UNEP/POPS/POPRC.10/INF/7/Rev.1), pointing to new fluorinated compounds as substances of concern.

409. In metal plating (hard metal plating) only in closed-loop systems: some parties report users having switched to PFOS-free chemicals, others reported that alternatives have been tested but have been found to be less efficient. While suppliers do offer PFOS-free products, according to users, not all processes are suitable for the use of PFOS-free mist suppressants/wetting agents. One alternative substance that has been identified for use is “3,3,4,4,5,5,6,6,7,7,8,8,8-Tridecafluorooctane-1-sulphonate”, (or 1H,1H,2H,2H- Perfluorooctane sulfonic Acid, CAS RN 27619-97-2). Another alternative substance that has been identified for use is perfluorobutane sulfonate, CAS RN 29420-49-3. Partially fluorinated alternatives (fluorotelomers) are considered to have shown sufficient properties.

410. Users tend to switch to PFOS-free fire-fighting foams according to the information provided by various parties. Caution has been expressed that not only PFOS-containing foams but also non-PFOS containing foams based on other fluorocompounds can damage the environment.

411. There are basic studies being developed in research centers and universities evaluating biological and natural products such as plant extracts for the control of leaf-cutting ants. The results, however, have been inconsistent, demonstrating technical, economic and operational difficulties.

412. For metal plating (hard metal and decorative plating), some parties reported users having switched to PFOS-free chemicals. One alternative substance that has been identified for use is “3,3,4,4,5,5,6,6,7,7,8,8,8-Tridecafluorooctane-1-sulphonate”, (or 1H,1H,2H,2H- Perfluorooctane sulfonic Acid, CAS RN 27619-97-2). Another alternative substance that has been identified for use is perfluorobutane sulfonate (CAS No. 29420-49-3); however H4PFOS is not considered a suitable substitution chemical for PFOS by some parties, given its characteristics, which are similar to PFOS. Alkylsulfonates are commonly used, degradable surfactants. The exact formulation is confidential business information, but the substitution of PFOS in the metal plating industry with non-fluorinated surfactants seems feasible for both bright chrome plating and hard chrome plating. In decorative plating, through the use of Cr3+ instead of Cr6+, the demisting foam may be omitted and thereby the need for PFOS. Plastic balls are one example that may be used in decorative electroplating. Several parties report that an extension of the specific exemption for metal plating (hard metal and decorative plating) will not be required in their case.

413. A PFOS precursor is used for the production of sulfluramide, which is an active ingredient of insect baits for control of leaf-cutting ants. Brazil is registered for the production and use for this acceptable purpose. The insect baits with sulfluramide as an active ingredient are exported to the neighbouring countries.

Stockpiles and waste

414. A number of parties reported that stock of fire fighting foams containing PFOS, its salts and PFOSF still exist. In Canada, based on a use pattern survey published in January 2005, stockpiles of PFOS-based AFFF were estimated to be approximately 300 tonnes, representing 3 tonnes of PFOS, at that time. In Switzerland, the stock has to be disposed of by 2018 and PFOS containing fire fighting foams that become waste have to be labelled as hazardous waste destined to be incinerated.

415. Several parties reported that there is a need to further improve the handling of waste containing PFOS. Some open literature suggests carpet treated with PFOS based products may still contain residual PFOS or precursor chemicals years after application. There is a high possibility of having contamination of landfills with PFOS, its salts and PFOSF, due to deposition of untreated municipal wastes. One of the parties reported that a few sites are known and measures are being taken to remediate these sites within their soil policy framework.

416. One party reported that it has experienced challenges in trying to follow the life cycle of chemicals, including PFOS, in products or articles, particularly at the recycling and disposal stage. It can be very difficult to identify which products contain PFOS, particularly in imported products. This makes it more difficult to follow the substance through its life cycle to its end of life management, and potential release to the environment. As a result, the party has considered a sector approach where the activities at waste management and recycling facilities are studied to ensure they are well understood, and that best management practices are identified that prevent or minimize releases of any toxic substance from these facilities. This information would complement other work being undertaken to fill the information gaps to allow a substance to be followed through its life cycle to end of life management.

417. The general technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with POPs and the technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with PFOS, its salts and PFOS developed under the Basel Convention provide information to assist parties towards environmental sound management of PFOS waste.

(c) Main findings

418. Due to stricter legislation and control worldwide, there has been a significant drop in the production and use of PFOS, its salts and PFOSF from 2003 until today.[44] The most important global producer phased out the production of PFOS, its salts and PFOSF in 2003. Quantitative data on production have been available from this single major global producer so far, but it is considered that the combined capacity of the other producers was much less. The production volumes fell from around 3500 tonnes per year in 2000 to approximately 200 tonnes per year in 2001 and 2002; production was discontinued in 2003. The European Union Scientific Committee on Health and Environmental Risks notes that use of PFOS and PFOS related substances in consumer applications such as carpets, leather/apparel, textiles/upholstery, paper and packaging, coatings, industrial and PFOS household cleaning products, pesticides and insecticides has been largely abandoned following the announcement of the main global producer to phase out manufacture and use of PFOS consumer applications. Uncertainty however remains as to the current levels of use taking into account the limited quantitative data available.

419. Providing a global overview of the production and use of PFOS, its salts and PFOSF is currently challenging. Data gaps are notable in developing country Parties and Parties with economies in transition. A majority of Parties are in the process of updating their NIPs, through which initial information on the national situation may become available.

420. Identification of products that contain PFOS is difficult, particularly in imported products. This makes it more difficult to follow the substance through its life cycle to its end of life (waste) management, and potential release to the environment.

(d) Conclusions and recommendations

421. While a significant drop in the production and use of PFOS, its salts and PFOSF has clearly been achieved, limited information and data prevent this evaluation from providing a comprehensive global overview of production and use.

422. Phasing out the use of PFOS, its salts and PFOSF is challenging due to the paucity of information on alternative substances or methods, the lack of financial resources and insufficient technical capacity.

[44] UNEP/POPS/COP.7/INF/11.

***Recommendation**: Parties that are developing countries and countries with economies in transition need to build their capacity to identify and collect information on PFOS, its salts and PFOSF, to strengthen the legislation and/or regulations to manage the chemicals throughout their lifecycles, and to introduce safer, effective and affordable alternatives to PFOS, its salts and PFOSF.*

Lindane and endosulfan

423. In addition to the national reports and NIPs, other information on lindane and endosulfan has been reviewed and reported to the Conference of the Parties at its fifth, sixth and seventh meetings. The documents on lindane and endosulfan are listed in Table B.1.14.

Table B.1.14. *Documents on lindane and endosulfan reported to the Conference of the Parties*

Document symbol	Title
UNEP/POPS/COP.5/INF/13/Rev.1	Additional information to supplement the report on the development of reporting and reviewing requirements for the use of lindane
UNEP/POPS/COP.6/INF/4/Rev.1	Report on a study of health sector information sources on the availability of lindane as a pharmaceutical and its alternatives as a treatment for head lice and scabies
UNEP/POPS/COP.7/INF/4	Report of the expert consultation on the review of information on lindane and its alternatives in the treatment of scabies and head lice
UNEP/POPS/COP.6/11	Work programme on endosulfan
UNEP/POPS/POPRC.8/INF/28	Report on the assessment of chemical alternatives to endosulfan
UNEP/POPS/POPRC.8/INF/29	Fact sheets on chemical alternatives to endosulfan
UNEP/POPS/POPRC.8/INF/14/Rev.1	Evaluation of non-chemical alternatives to endosulfan
UNEP/POPS/POPRC.8/INF/15	A summary of information on chemical and non-chemical alternatives to endosulfan submitted by parties and observers

424. The report of the expert consultation on the review of information on lindane and its alternatives in the treatment of scabies and head lice (UNEP/POPS/COP.7/INF/4) was submitted for consideration at the seventh meeting of the Conference of the Parties. By decision SC-7/1, the COP encouraged parties to consider the following conclusions of the expert consultation when promoting alternatives to lindane:

(a) Scabies and head lice are problems around the globe and will continue to be so in the foreseeable future;

(b) Lindane continues to be used in some countries for the treatment of both these conditions;

(c) Safer and more effective alternatives for the treatment of both these conditions are commonly available;

(d) Lack of awareness of adverse effects, toxicity, being considered as low cost and the non-accessibility of alternatives to lindane are among the key factors for continued use in some countries;

(e) Some countries have successfully instituted regulatory actions for banning or restricting the use of lindane for head lice and scabies;

(f) These regulatory actions have resulted in marked decrease in the use of lindane;

(g) Exchanging information among countries on the regulatory and other actions would assist other countries in decreasing and ultimately eliminating the use of lindane;

(h) The WHO integrated approach for the Prevention and Control of Neglected Tropical Diseases provides a framework for introducing alternative treatments for scabies and head lice and the ultimate elimination of the use of lindane.

425. The report on the assessment of alternatives to endosulfan (UNEP/POPS/COP.6/11)was submitted by the POPs Review Committee for consideration by the Conference of the Parties at its sixth meeting. The COP encouraged parties to consider the outcome of the assessment when choosing alternatives to endosulfan for available specific exemptions including the following conclusions:

(a) A total of 84 chemical alternatives to endosulfan were not likely to fulfil the criteria of persistence and bioaccumulation in Annex D to the Convention. Further, it reported that no parties provided information on volumes of endosulfan used for the crop-pest complexes for which specific exemptions are available under part VI of Annex A to the Convention and that some parties continue to import endosulfan for use;

(b) Guidance and technical assistance along with activities to raise awareness of stakeholders on the need for control measures on endosulfan and lindane and available safer chemical and non-chemical alternatives, in collaboration with relevant inter-governmental organizations including the World Health Organization and the Food and Agriculture Organization will be further needed to ensure transition from the reliance on lindane and endosulfan.

(a) Main findings

426. Safer and effective alternatives to lindane and endosulfan are commonly available. Many parties have successfully instituted regulatory actions for banning or restricting the use of these two chemicals.

(b) Conclusions and recommendations

427. Safer and effective chemical and non-chemical alternatives to lindane and endosulfan are available.

***Recommendation**: Guidance and technical assistance along with activities to raise awareness about the need to use alternatives, given the control measures on lindane and endosulfan, and approaches for phasing-in alternatives are further needed to ensure full transition from the reliance on these chemicals.*

2. Measures to reduce or eliminate releases from unintentional production (Article 5)

428. The outcome to be addressed in assessing the effectiveness of Article 5 is whether the total quantities of persistent organic pollutants that are produced unintentionally and released into the environment have been reduced or, where feasible, eliminated.

429. Reductions in estimated releases are indicators of effectiveness. Periodic inventories of releases of unintentionally produced persistent organic pollutants could also help in interpreting data on levels of persistent organic pollutants collected under the global monitoring plan.

430. Seven indicators have been identified for this outcome:

Process indicator 1	Number of parties with action plans under Article 5
Process indicator 2	Number of parties that have subsequently implemented their action plans as part of implementation plans
Process indicator 3	Number of these parties that have undertaken five-year reviews of the strategies to meet the obligations in Article 5
Process indicator 4	Number of parties that have promoted the adoption of best available techniques and best environmental practices for priority source categories
Process indicator 5	Number of parties that have adopted measures that require best available techniques for priority source categories
Process indicator 6	Number of parties that have evaluated the efficacy of the laws and policies relating to the management of releases.
Source of information for the indicator	Section IV of part B of the national reports
Data limitations	The degree to which an action plan is implemented is not measured, but a national evaluation of the effectiveness of measures taken can provide insights into the success of implementation. Parties that have undertaken national evaluations could be encouraged to share the information generated.
Baseline	Entry into force of the Convention.

Outcome indicator 7	Percentage change in the quantity of Annex C persistent organic pollutants produced unintentionally and released into the environment by each party
Source of information for the indicator	Section IV of part B of the national reports
Data limitations	It is difficult to compile data from different parties as a result of differences in methodologies and years in which inventories in the parties were compiled. Comparisons can therefore only be made within countries. When action plans are reviewed every five years, an update of the inventories can be used to establish trends, provided that the data are comparable and, if necessary, older data are recalculated to reflect changes in the methodology (e.g., revised emission factors).
Baseline	The year of the initial inventory in a particular party.

(a) Chemicals addressed under Article 5

431. Article 5 provides measures to reduce or eliminate releases from unintentional production of chemicals listed in Annex C to the Convention. As of 30 April 2016, the following chemicals are listed in Annex C:

(a) Polychlorinated dibenzo-p-dioxins (PCDD);

(b) Polychlorinated dibenzofurans (PCDF);

(c) Polychlorinated biphenyls (PCB);

(d) Hexachlorobenzene (HCB);

(e) Pentachlorobenzene (PeCBz).

432. Among the POPs listed in Annex C, PCDD/PCDF are indicative of other unintentional POPs and can be used as a basis for identifying and prioritizing sources of unintentional POPs, as well as for evaluating the efficacy of adopted mitigation measures (UNEP 2013). The formation of PCDD/PCDF is accompanied by releases of the other unintentional POPs, and their minimization or elimination can be achieved by the same measures. Therefore, PCDD/PCDF releases are considered as the key indicator for evaluating the efficacy of Article 5 of the Convention (UNEP/POPS/COP.7/INF/19).

433. While this section addresses the releases of these chemicals to air, water, land, products and residues, information on the changes in concentrations of these chemicals in the environment and in human populations is presented in section II.A.1 (Table A.1.1).

(b) Available information

Relevant decisions of the Conference of the Parties

SC-1/19: Guidelines on best available techniques and best environmental practices relevant to Article 5	Decides to establish an Expert Group on Best Available Techniques and Best Environmental Practices
SC-3/5: Guidelines on best available techniques and provisional guidance on best environmental practices	Adopts the revised draft guidelines on best available techniques and provisional guidance on best environmental practices
SC-3/6: Ongoing review and updating of the Standardized Toolkit for Identification and Quantification of Dioxin and Furan Releases	Requests the Secretariat to initiate an open, transparent process, in cooperation with the Chemicals Branch of the United Nations Environment Programme's Division of Technology, Industry and Economics and in consultation with users and specialized experts in the field of emission factors and measurements related to releases of Annex C persistent organic pollutants, to develop further the Toolkit
SC-4/7: Standardized Toolkit for the Identification and Quantification of Dioxin and Furan Releases	Adopts the process for the ongoing review and updating of the Toolkit, within available resources, as set forth in the annex to the present decision
SC-5/12: Guidelines on best available techniques and provisional guidance on best environmental practices	Adopts the procedure for updating the guidelines and guidance set forth in the annex to the present decision and acknowledges that, besides those relevant to Article 5 and Annex C, other aspects of best available techniques and

	best environmental practices relevant to all persistent organic pollutants listed in the annexes to the Convention should be considered
SC-6/9: Toolkit for Identification and Quantification of Releases of Dioxin, Furans and Other Unintentional Persistent Organic Pollutants	Welcomes the revised Toolkit for Identification and Quantification of Releases of Dioxins, Furans, and Other Unintentional Persistent Organic Pollutants

434. By decision SC-6/9, the Conference of the Parties to the Stockholm Convention requested the Toolkit experts to prepare a preliminary analysis of the information on unintentional releases of persistent organic pollutants provided through national reports pursuant to Article 15, in view of the evaluation of the effectiveness of the Convention and according to the timelines indicated in the effectiveness evaluation framework upon its approval by the Conference of the Parties.

435. The information supporting the analysis conducted by the Toolkit experts, summarized below, was collected from either the third, second, first national reports or the national implementation plans (NIPs). Of the 180 parties to the Stockholm Convention, 164 parties had submitted at least one of the four sources of information (see the Annex to this report). Details of the Toolkit experts' analysis may be found in document UNEP/POPS/TOOLKIT/BATBEP/2016/2[45].

Guidance documents

436. The following guidance documents have been developed to assist parties in developing inventories and minimizing releases of POPs from unintentional production pursuant to Article 5 of the Convention:

(a) Toolkit for Identification and Quantification of Releases of Dioxins, Furans and Other Unintentional POPs under Article 5 of the Stockholm Convention on Persistent Organic Pollutants (http://toolkit.pops.int/);

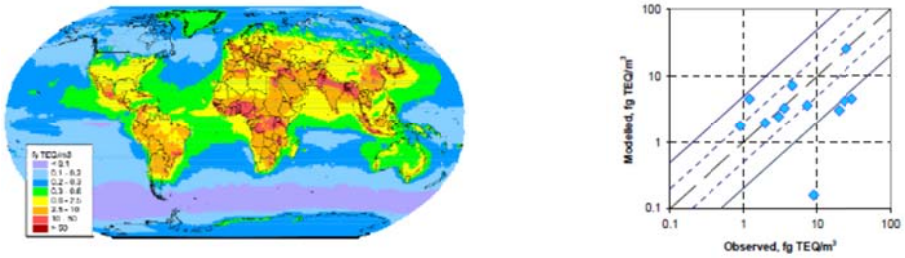
(b) Guidelines on best available techniques and provisional guidance on best environmental practices relevant to Article 5 and Annex C of the Stockholm Convention on Persistent Organic Pollutants (http://chm.pops.int/Implementation/BATBEP/BATBEPGuidelinesArticle5/tabid/187/Default.aspx).

437. The Toolkit is particularly useful in guiding parties to assess the progress made in the implementation of Article 5 of the Convention, namely determining whether the measures taken to reduce and ultimately eliminate releases of Annex C POPs are successful in meeting their objectives. Being based on systematic expert consultation, the Toolkit can be considered as the most advanced and comprehensive compilation of emission factors for unintentional POPs.

[45] http://chm.pops.int/Default.aspx?tabid=5324

438. This is also confirmed by studies showing that modelling of global dispersion of PCDD/PCDF using a global inventory of emissions compiled under the Stockholm Convention reasonably reproduces observed levels of air concentrations. These studies support the emission factors provided in the Toolkit, confirming the robustness of the guidance (EMEP 2015, Figure B.2.1).

Figure B.2.1. *Left panel: Spatial distribution of modelled annual mean PCDD/F concentrations in air (fg TEQ/m3) in 2012. Right panel: Comparison of modelled annual mean PCDD/F air concentrations with measurements performed in South America region in 2012. Dashed lines denote the area of agreement between modelled and measured values within a factor of 2, solid lines – within a factor of 5. (EMEP 2015)*



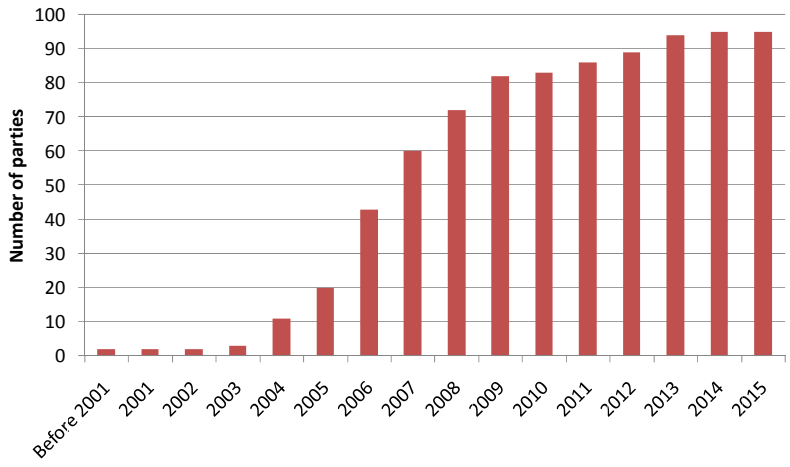
439. The guidelines on best available techniques and best environmental practices provide parties with up-to-date technical information needed to implement measures aimed at minimizing releases of the POPs listed in Annex C, as part of their action plans.

(c) Analysis of available information and application of the framework

Process indicator 1: Number of parties with action plans under Article 5

440. 112 parties (62%) provided information on their action plans under Article 5as part of their national reports or, if this source of information is not available, in their NIPs. 95 of these provide information on the year of the action plan. Figure B.2.2 shows the cumulative number of parties having developed their action plans in specific years[46]. A majority of parties are shown to have developed their action plans after to entry into force of the Convention (between 2004 and 2009, with the initial set of NIPs). The Convention has clearly triggered action planning for the minimization of releases of unintentional POPs at the global level.

Figure B.2.2. *Number of parties with action plans contributing to Article 5*



Process indicator 2: Number of parties that have subsequently implemented their action plans as part of implementation plans

441. Information relevant to the actual implementation of the action plans under Article 5 is limited. A total of 63 parties report such implementation being difficult (35%) and 30 parties do not encounter difficulties in the implementation of the plan (16%). Information from the remaining parties to the Convention is either unreported or unavailable.

[46] A number of parties report having taken action contributing to the implementation of Article 5 prior to the entry into force of the Convention, as of before 2001.

Process indicator 3: Number of these parties that have undertaken five-year reviews of the strategies to meet the obligations in Article 5

442. A minority of parties (37 in total; 20%) report having undertaken five-year reviews of the strategies to meet the obligations in Article 5. Such reviews are important to enable parties to track their progress towards the minimization of releases of unintentional POPs and re-set national priorities accordingly.

Process indicator 4: Number of parties that have promoted the adoption of best available techniques and best environmental practices for priority source categories

443. 54 parties (30%) have promoted the adoption of best available techniques and best environmental practices for priority source categories. For 13 additional parties (7%), the development of such measures was in progress at the time of their reporting. The remainder report either that such measures are not in place or provide no relevant information.

Process indicator 5: Number of parties that have adopted measures that require best available techniques for priority source categories

444. 51 parties (28%) have adopted measures that require best available techniques for priority source categories.

Process indicator 6: Number of parties that have evaluated the efficacy of the laws and policies relating to the management of releases

445. 56 parties (31%) have evaluated the efficacy of the laws and policies relating to the management of releases, and 9 (5%) report such an evaluation being in progress.

Outcome indicator 7: Percentage change in the quantity of Annex C persistent organic pollutants produced unintentionally and released into the environment by each party

446. Table B.2.1 shows the distribution of total global releases of PCDD/PCDF among the five release vectors (air, water, land, products and residues). Overall, a minimal increase (0.1%) is observed globally between the releases reported in the baseline and in the updated inventories. There is a positive correlation between releases and the size of the population and a negative correlation with the economic status of the country (Fiedler 2015).

Table B.2.1. *Global releases of PCDD/PCDF (g TEQ/year)*

N=139	Air	Water	Land	Product	Residue	Total
Baseline*	541,942.5	14,124.8	91,953.3	9,187.6	155,642.1	812,850.3
% of total releases	*66.7*	*1.7*	*11.3*	*1.1*	*19.1*	*100*
Most recent**	546,412.9	14,235. 8	91,553.4	7,883.2	154,239.1	814,324.5
% of total releases	*67.1*	*1.7*	*11.2*	*1.0*	*18.9*	*100*

* Reference years range from 2001 to 2011 for the baseline inventories

**Reference years range from 2001 to 2015 for the most recent inventories

447. At the regional level, the increases noted over time in Asia Pacific and CEE regions (Table B.2.2) are due to single parties (one per region) reporting significantly higher releases in their most up-to-date inventories. It is difficult to conclude whether these changes are due to actual increases in releases or to new information having become available that was not reflected in the baseline / previous inventories.

Table B.2.2. *Changes in total releases over time according to UN region*

Region	**Releases (g TEQ/year)**		**% change (total over the period from the baseline inventory to the updated inventory)*** **
	Baseline*	Most recent**	
Africa	507,561.7	505,428.3	-0.4 %
Asia and the Pacific	29,503.8	30,897.1	+4.7 %
CEE	193,929.3	198,084	+2.1 %
GRULAC	79,075.3	78,281.9	-1 %
WEOG	2,780.3	1,633.3	-41.3 %
Global	812,850.3	814,324.5	+0.1 %

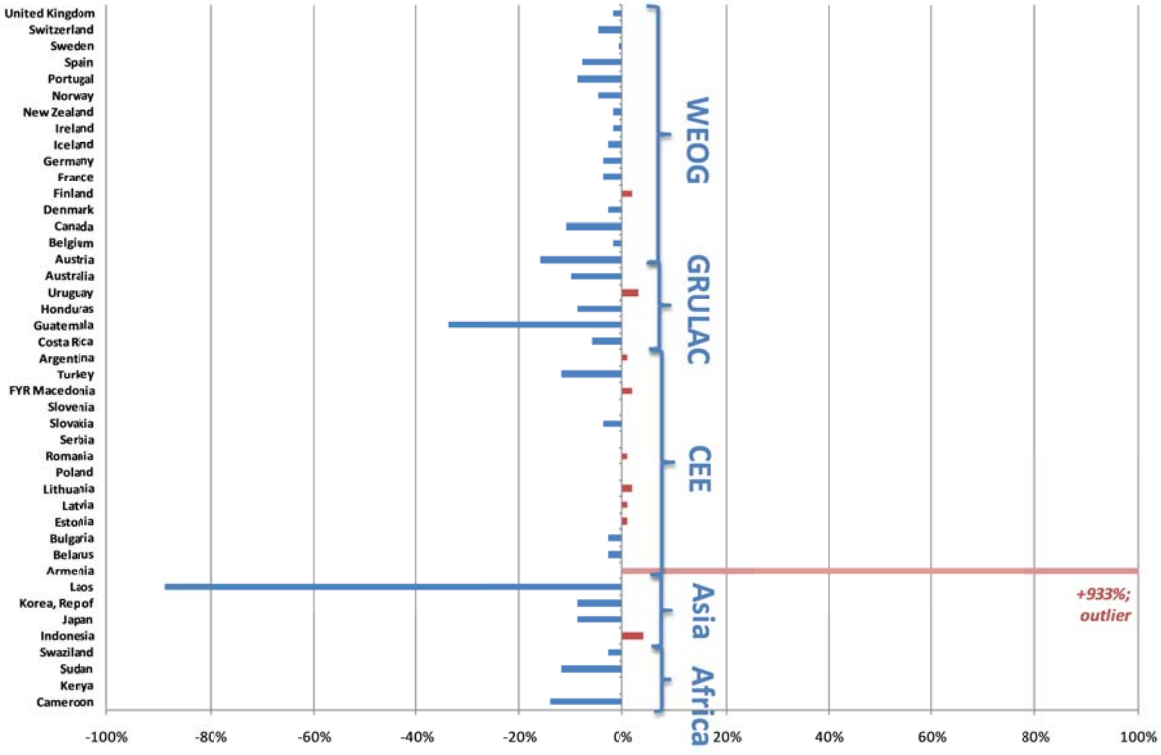
* Reference years range from 2001 to 2011 for the baseline inventories

**Reference years range from 2001 to 2015 for the most recent inventories

*** % annual change per region is shown in Figure B.2.3

448. Time series data are mostly reported in CEE and WEOG, while more limited information is available for Africa, Asia Pacific and GRULAC regions. Information on changes over time in PCDD/PCDF releases is presented in more detail in Figure B.2.3 below.

Figure B.2.3. *Annual change (%) in PCDD/PCDF releases. Reference years range from 2001 to 2011 for the baseline inventories and from 2001 to 2015 for the most up-to-date inventories. Left panel (blue bars) shows decreasing levels. Right panel (red bars) shows increasing levels. Outliers are marked.*

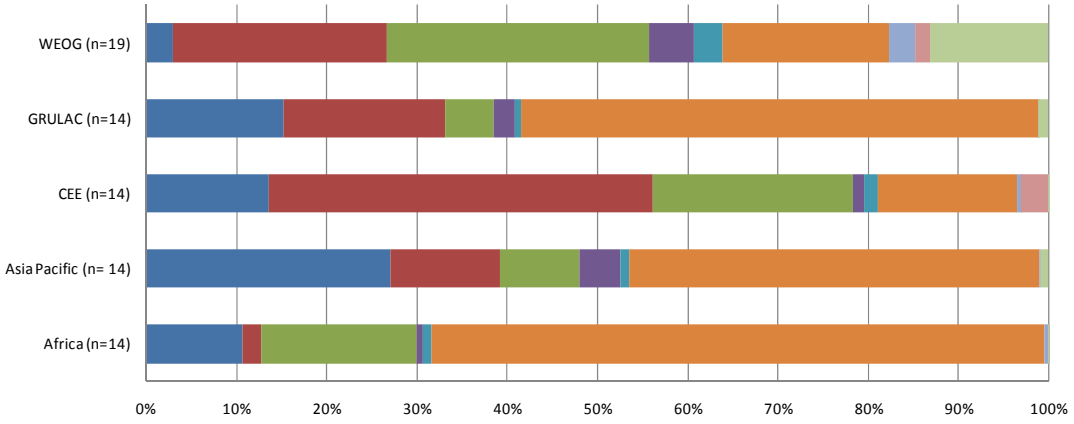


449. As shown in Figure B.2.3, the rate of annual decrease in releases in WEOG and CEE is lower than in other regions, as emissions had been mitigated before the entry into force of the Stockholm Convention, under the UNECE LRTAP POPs protocol, and are currently managed at low levels. Larger decreases are observed in the other regions, where action to minimize such releases was taken more recently pursuant to the Stockholm Convention.

450. The highest contributor to global air releases is open burning with 50%, followed by waste incineration (17%), and metal industry and heat and power generation with 14 and 13% respectively. The relative contribution of each source group to the aggregated regional releases is shown in Figure B.2.4 below. Open burning is the highly dominant source of release to air in Africa, Asia Pacific and GRULAC, while heat and power generation is the major contributor to air releases in CEE and WEOG (along with the metal industry).

451. High-income countries tend to have lowest average releases of PCDD/PCDF per capita, whereas lower middle-income countries have highest releases. In the high-and upper middle-income countries, metal recycling processes are the second highest emitters, numerically very close to open burning, the largest emitter (Fiedler 2015).

Figure B.2.4. *Contribution by sources to PCDD/PCDF releases to air according to the UN region*



	Africa (n=14)	Asia Pacific (n= 14)	CEE (n=14)	GRULAC (n=14)	WEOG (n=19)
Waste incineration	608.6	1597.3	249.0	651.8	40.4
Metal industry	114.8	712.7	776.1	764.7	320.4
Power generation	973.6	521.0	402.7	231.5	393.8
Mineral production	38.6	266.3	25.0	98.9	66.7
Transportation	52.1	56.6	27.0	26.9	43.2
Open burning	3835.1	2679.9	280.9	2448.1	250.1
Chemicals and consumer products	26.6	7.6	9.4	5.8	39.4
Waste disposal	0.1	0.0	54.4	0.9	23.3
Miscellaneous	3.6	54.4	1.4	47.4	177.4

(d) Main findings

Action plans and their implementation under Article 5

452. The Convention has acted as a trigger for initial action planning to minimize and ultimately eliminate releases of unintentional POPs worldwide. A majority of Parties (62%) have developed their national action plans further to the entry into force of the Convention, but only a limited number of Parties (20%) have reviewed and updated their national action plans pursuant to paragraph (a) (v) of Article 5. Information relevant to the actual implementation of the action plans under Article 5 is limited.

453. Toolkit for Identification and Quantification of Releases of Dioxins, Furans and Other Unintentional POPs under Article 5 of the Stockholm Convention on POPs is continuously updated based on systematic expert consultation, and can be considered as the most advanced and comprehensive compilation of emission factors for unintentional POPs. This is also confirmed by studies showing that modelling of global dispersion of PCDD/PCDF using a global inventory of emissions compiled under the Stockholm Convention reasonably reproduces observed levels of air concentrations.

Application of best available techniques and best environmental practices

454. Only one third of the Parties to the Convention seem to have phased in measures that promote (30%) or require (28%) best available techniques and best environmental practices to control their releases of unintentional POPs from priority sources, while stating lack of capacity and financial resources as the reason.

Changes in PCDD/PCDF releases overtime

455. A minimal change (0.1%) is observed between global baseline releases (2001-2011) and updated releases (2001-2015). Overall, total releases have a positive correlation with the size of the population and a negative correlation with the economic status of the country.

456. The highest contributor to global air releases is open burning, followed by waste incineration, the metallurgical industry, and heat and power generation. Open burning is the highly dominant source of release to air in Africa, Asia Pacific and Latin America and the Caribbean, while heat and power generation along with the metal industry are the major contributors to air releases in the Central and Eastern Europe and Western European and Others Group.

457. The rate of annual decrease in releases in Central and Eastern Europe and Western European and other countries is lower than in other regions, as emissions had already been reduced prior to the entry into force of the Stockholm Convention under the obligations of the POPs Aarhus Protocol adopted in 1998 under the United Nations Economic Commission for Europe Convention on Long Range Transboundary Air Pollution (CLRTAP). Current releases in these regions are very low. Larger decreases are observed in the other regions, where action to minimize such releases was taken more recently pursuant to the Stockholm Convention.

(e) Conclusions and recommendations

458. Releases of unintentional POPs have been successfully reduced in some regions by regulations that predated the Convention and have been maintained since. By requiring similar actions to be taken at the global level, the Convention is expected to result in decreasing levels of unintentional POPs releases in all regions of the globe. Currently less than one third of the Parties are promoting or requiring best available techniques and best environmental practices to control their releases of unintentional POPs from priority sources.

Recommendation: *Parties should develop and maintain up-to-date their action plans to minimize and ultimately eliminate releases of unintentionally produced POPs. Actions should be taken to enhance implementation of requirements for the use of best available techniques and best environmental practices for the priority sources identified.*

459. Inventories of sources and releases provide the main basis for assessing the effectiveness of Article 5 of the Convention. Overall, release estimates reported pursuant to Article 15 or through the NIPs, are difficult to compile, process, and most of all, analyze due to a number of limitations. In particular, to enable the assessment of trends over time, comparable data are needed for at least two points in time. The Toolkit for Identification and Quantification of Releases of Dioxins, Furans and Other Unintentional POPs under Article 5 of the Stockholm Convention on POPs provides useful guidance to this end.

Recommendation: *Parties should pay more attention to issues related to quality assurance/quality control (QA/QC) of inventories and consistency and comparability of data reported for various reference years. The process for updating release estimates in order to reveal trends over time should be considered in conjunction with the revision (recalculation or correction) of previous release estimates. The Toolkit for Identification and Quantification of Releases of Dioxins, Furans and Other Unintentional POPs under Article 5 of the Stockholm Convention on POPs should be used for this purpose.*

460. Time series data confirming trends over time in releases of unintentionally produced POPs are limited, particularly for developing country Parties, but some initial results showing decreases over time have been obtained to date.

Recommendation: *Parties should develop and update their inventories of unintentional POPs, and provide the information as part of their national reports to confirm the success of the measures they have taken to implement Article 5.*

3. Measures to reduce or eliminate releases from stockpiles and wastes (Article 6)

461. The outcome to be addressed in assessing the effectiveness of Article 6 is whether there has been a reduction in the levels of persistent organic pollutants being released into the environment from stockpiles and wastes.

462. Information on the number of products and articles in use and the quantity of wastes that consist of or are contaminated with persistent organic pollutants is useful and particularly relevant for some of the newly listed persistent organic pollutants. Even though this information is likely to prove difficult to obtain, parties are requested to look into the feasibility of collecting these data.

463. Nine indicators have been identified for this outcome:

Process indicator 1 Process indicator 2	Number of parties that have developed and used appropriate strategies to identify stockpiles Number of parties with measures in place to manage stockpiles in a safe, efficient and environmentally sound manner
Source of information for the indicator	Section V of part B and section I of part C of the national reports.
Data limitations	Estimates of quantities of stockpiles are subject to error and may need to be corrected over time.
Baseline	Entry into force of the Convention or its amendments
Outcome indicator 3	Changes in the quantity of stockpiles being managed in an environmentally sound manner
Source of information for the indicator	Section V of part B and section II of part C of the national reports.
Data limitations	Estimates of quantities of stockpiles are subject to error and may need to be corrected over time.
Baseline	Entry into force of the Convention or its amendments
Process indicator 4 Process indicator 5 Outcome indicator 6	Number of parties with measures in place to manage wastes in an environmentally sound manner Number of parties that have developed and used appropriate strategies to identify products and articles in use and wastes containing persistent organic pollutants Quantity of wastes identified and destroyed over time (includes wastes of products and articles consisting of or contaminated with persistent organic pollutants)
Source of information for the indicator	Section V of part B and sections II and III of part C of the national reports
Data limitations	Given that wastes are generally mixtures of substances, estimates of quantities of persistent organic pollutant wastes are subject to large errors. Information on wastes of products and articles consisting of or contaminated with persistent organic pollutants is probably difficult to collect, but is important for the newly listed persistent organic pollutants.
Baseline	Entry into force of the Convention or its amendments
Process indicator 7 Process indicator 8 Process indicator 9	Number of parties that have developed and used appropriate strategies to identify contaminated sites Number of parties that have identified contaminated sites Number of parties that have voluntarily undertaken remediation activities
Source of information for the indicator	Section V of part B of the national reports
Data limitations	Not applicable.
Baseline	Entry into force of the Convention or its amendments

(a) Available information

Relevant COP decisions and processes

SC-4/8: Wastes	Notes the development of an interactive electronic training tool by the Secretariat and the work being undertaken regionally to support Parties in implementing environmentally sound management of persistent organic pollutant wastes and polychlorinated biphenyls

SC-7/9: Measures to reduce or eliminate releases from wastes	Welcomes with appreciation decision BC-12/3 on technical guidelines on persistent organic pollutants, by which the Conference of the Parties to the Basel Convention on the Control of the Transboundary Movements of Hazardous Wastes and Their Disposal, at its twelfth meeting, adopted updated general technical guidelines for the environmentally sound management of wastes consisting of, containing or contaminated with persistent organic pollutants and encourages the introduction and demonstration in developing countries and countries with economies in transition of cost-effective methods selected from those listed in section IV.G of the general technical guidelines

464. The information relevant to Article 6 was collected from either the third, second, first national reports or the national implementation plans (NIPs). As of 30 April 2016, of the 180 parties to the Stockholm Convention, 164 parties had submitted at least one of the four sources of information (see the Annex to this report).

Guidance documents

465. By decision BC-12/3, the Conference of the Parties to the Basel Convention adopted:

(a) General technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with persistent organic pollutants (UNEP/CHW.12/5/Add.2/Rev.1);

(b) Technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride (UNEP/CHW.12/5/Add.3/Rev.1);

(c) Technical guidelines on the environmentally sound management of wastes containing or contaminated with unintentionally produced polychlorinated dibenzo-p-dioxins, polychlorinated dibenzofurans, hexachlorobenzene, polychlorinated biphenyls or pentachlorobenzene(UNEP/CHW.12/5/Add.4/Rev.1);

(d) Technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with hexabromodiphenyl ether and heptabromodiphenyl ether, or tetrabromodiphenyl ether and pentabromodiphenyl ether (UNEP/CHW.12/5/Add.6/Rev.1);

(e) Technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with hexabromocyclododecane (UNEP/CHW.12/5/Add.7/Rev.1);

(f) Technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with the pesticides aldrin, alpha hexachlorocyclohexane, beta hexachlorocyclohexane, chlordane, chlordecone, dieldrin, endrin, heptachlor, hexachlorobenzene, lindane, mirex, pentachlorobenzene, perfluorooctane sulfonic acid, technical endosulfan and its related isomers or toxaphene or with hexachlorobenzene as an industrial chemical (UNEP/CHW.12/5/Add.9).

466. By decision BC-12/5, the Conference of the Parties to the Basel Convention adopted, on an interim basis, the technical guidelines on transboundary movements of electrical and electronic waste and used electrical and electronic equipment (UNEP/CHW.12/5/Add.1/Rev.1).

(b) Analysis of available information and application of the framework

Process Indicator 1: Number of parties that have developed and used appropriate strategies to identify stockpiles

467. Out of 180 parties to the convention, 59 parties (33%) reported having developed and used appropriate strategies to identify stockpiles, whereas 5 parties (3%) were developing such strategies at the time of their reporting; 48 parties (27%) had clearly not initiated the development of such strategies. Strategies were developed in various years and in many instances they were developed before the entry into force of the Stockholm Convention. They are in most cases related to PCB, PBDEs and PFOS.

Process Indicator 2: Number of parties with measures in place to manage stockpiles in a safe, efficient and environmentally sound manner

468. Out of 180 parties to the convention, 70 parties (39%) reported having measures in place to manage stockpiles in a safe, efficient and environmentally sound manner, whereas 58 parties (32%) reported not having these measures in place. For the remaining 29%, information on the matter is not available.

Outcome indicator 3: Changes in the quantity of stockpiles being managed in an environmentally sound manner

469. Quantitative information on the stockpiles being managed in an environmentally sound manner is limited. In Africa, an estimated 20 per cent of the over 27,000 metric tonnes of obsolete pesticide stockpiles consist of POPs that have been banned under the Stockholm Convention (UNEP 2013). According to an inventory maintained by FAO, there are 537,000 metric tonnes of obsolete pesticides were accounted for in Africa, Asia, Eastern Europe, Latin America and the Middle East. The four countries with the highest stockpiles included the Russian Federation (100,000 metric tonnes), Macedonia (38,000 metric tonnes), Ukraine (25,000 metric tonnes) and Mali (14,000) (FAO 2011).

470. The challenges of stockpile management of developing countries can be seen in the African Stockpiles Programme. According to the World Bank's 2013 report, 3,310 tonnes of pesticide stocks have been removed from 897 sites under the Programme since 2005, a small proportion of the estimated total 50,000 tonnes of stocks (World Bank 2013).

471. Recent examples of contamination show that even industrialized countries with adequate destruction capacity of modern technology and a well-established regulatory framework can still struggle to manage POPs stockpiles and wastes in an environmentally sound manner (Weber et al. 2015).

Process indicator 4: Number of parties with measures in place to manage wastes in an environmentally sound manner

472. 52 parties (29%) report having measures in place to manage wastes in an environmentally sound manner. The breakdown of measures by chemicals indicates that PCB continue to be the main area of action, followed by PBDEs and PFOS.

Process indicator 5: Number of parties that have developed and used appropriate strategies to identify products and articles in use and wastes containing persistent organic pollutants

473. 80 parties (44%) have developed and used appropriate strategies to identify products and articles in use and waste containing POPs. Among these, specific strategies are reported for PCB (9%), PFOS (4%), and for all industrial chemicals (3%). For unintentional POPs, strategies were developed in various years, starting from a time before 2001 until recently.

Outcome indicator 6: Quantity of wastes identified and destroyed over time (includes wastes of products and articles consisting of or contaminated with persistent organic pollutants)

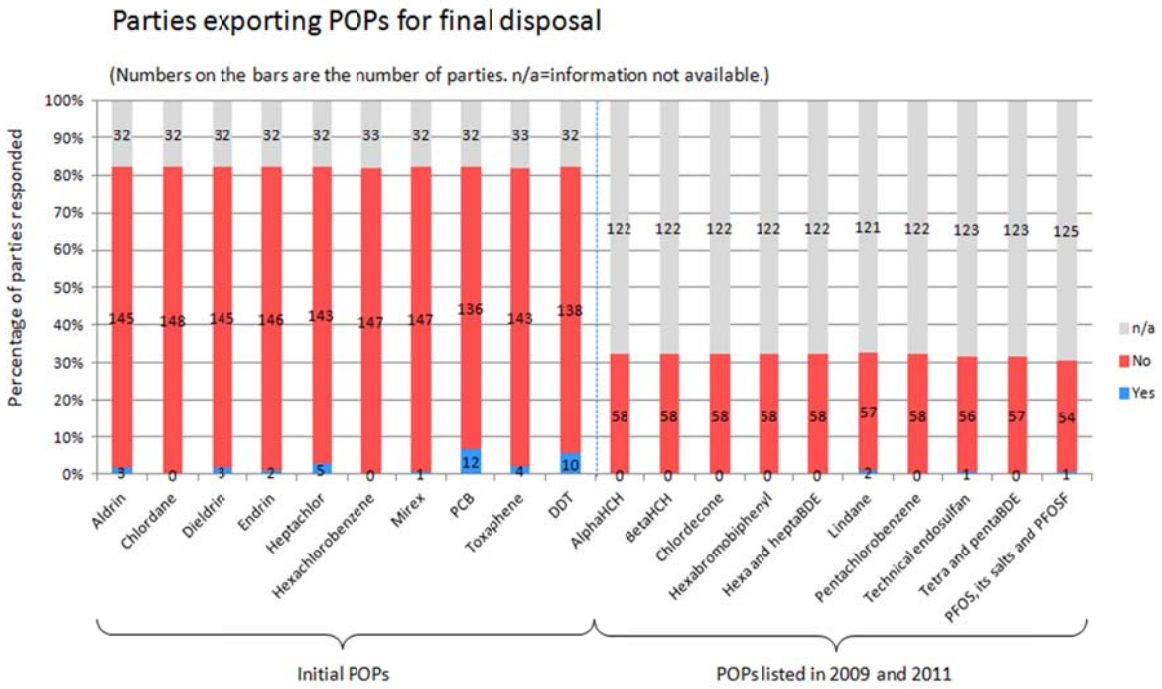
474. 59 parties (33%) have indicated that they have destroyed waste over time and 8 parties (4%) were in the process of destroying waste containing POPs. The quantities reported in the NIPs and in the different reporting cycles are very limited, and cover mostly exclusively information on PCB. It is generally difficult to identify a specific quantity of a specific POP waste which has been destroyed due to the nature of wastes whereby most of the data collected are limited and restricted to a particular point in time in the life-cycle, and considering that wastes contain mixtures of substances.

475. Information on import and export of POPs for environmentally sound waste disposal, including changes in quantities imported or exported for final disposal (see section II.B.1, outcome indicator 3) is also limited.

Quantities of chemicals exported for final disposal

476. The number of parties that exported POPs for final disposal during the period from before 2004 to2014 is shown in Figure B.3.1.

Figure B.3.1. *Number of parties that did or did not export POPs for final disposal from before 2004 to 2014*



477. The export of POPs for final disposal was reported for PCB (12 parties), DDT (10 parties), heptachlor (5 parties), toxaphene (4 parties), aldrin (3 parties), dieldrin (3 parties), endrin (2 parties), lindane (2 parties), mirex (1 party), endosulfan (1 party) and PFOS, its salts and PFOSF (1 party).

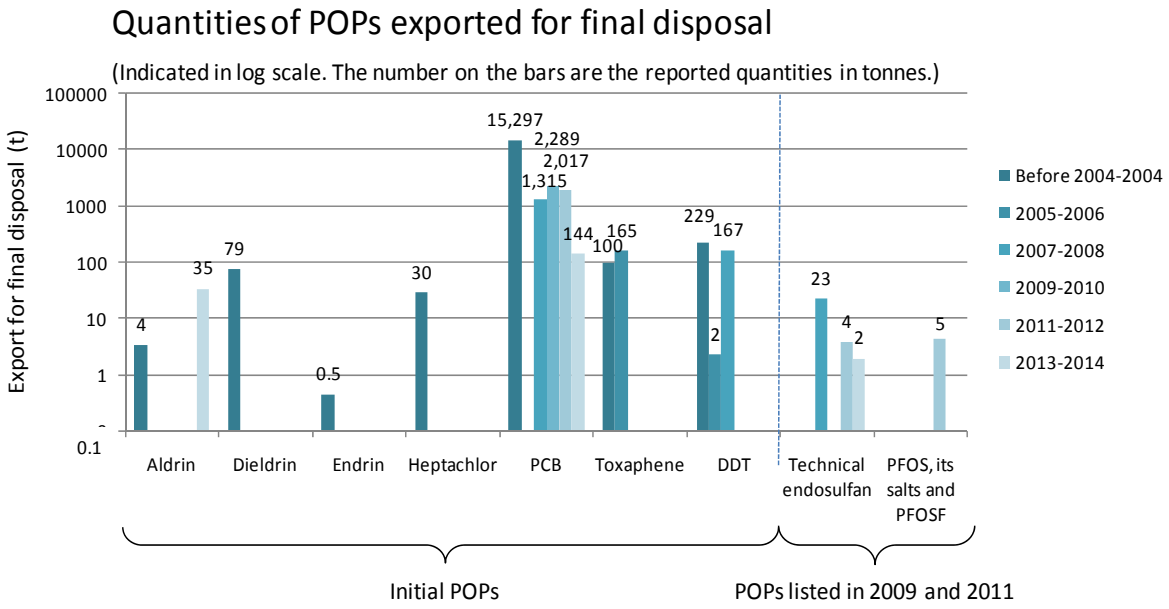
478. PCB and DDT were most often exported for final disposal. The destinations included Finland, France, Germany, Netherlands, Poland, Spain, Switzerland and United Kingdom. Most of the reported exports for POPs for final disposal were from developing countries or countries with economies in transition to developed countries.

479. The number of parties responded that they did not export POPs for final disposal was 136-148 parties for the 10 initial POPs and 54-58 parties for the 10 newly listed POPs.

480. Figure B.3.2 illustrates the changes in the quantities of POPs exported for final disposal over the period from before 2004 to2014.

481. 15 parties reported quantities of POPs exported for final disposal over the period between before 2004 and 2014.PCB and DDT had the most information. A large quantity of PCB has been exported to developed countries for final disposal, compared to pesticides.

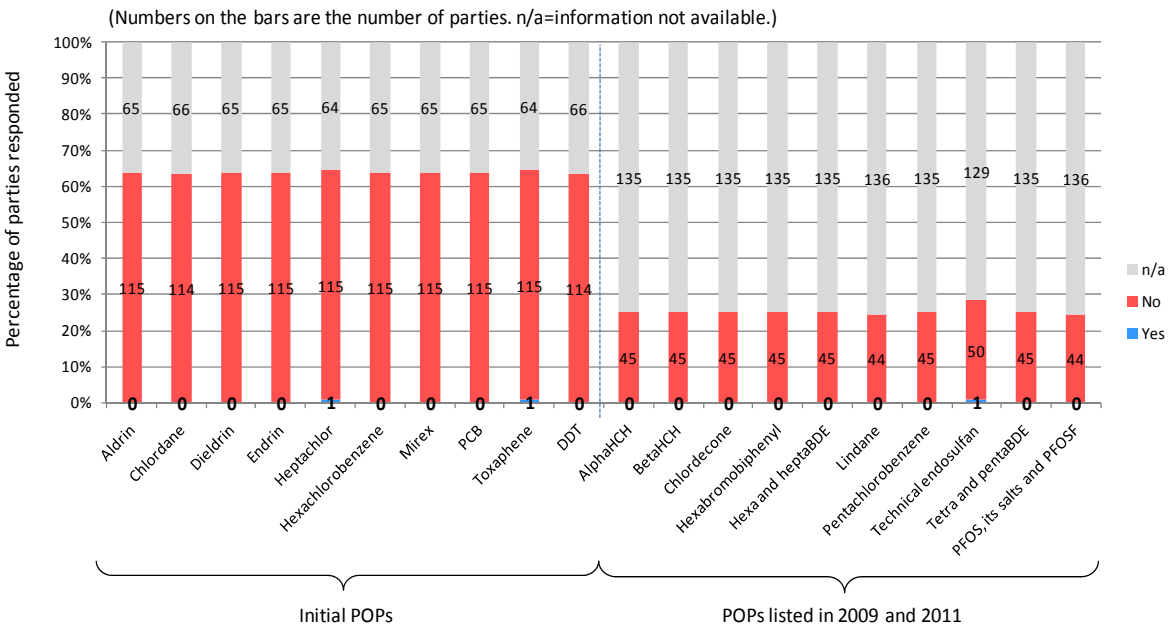
Figure B.3.2. *Changes in the quantities of POPs exported for final disposal from before 2004 to 2014*



Quantities of chemicals imported for final disposal

482. The number of parties that imported POPs for final disposal during the period from before 2004 to2014 is presented in Figure B.3.3.

Figure B.3.3. *Number of parties that did or did not import POPs for final disposal from before 2004 to 2014*



483. The information on import of POPs for final disposal was very limited. It was reported for only three pesticides: heptachlor (1 party), toxaphene (1 party), and endosulfan (1 party). The numbers did not match with the information available for the export of POPs for final disposal.

484. As there was only one party that reported the quantities of POPs imported for final disposal, it is not possible to discuss trends.

Process indicator 7: Number of parties that have developed and used appropriate strategies to identify contaminated sites

485. 60 parties (33%) of the total number of parties indicated having developed and used appropriate strategies to identify contaminated sites and 9 parties (5%) informed that strategies are in the process of being developed. For the remaining 58%, information regarding this matter is not available.

486. Strategies are reported to have been developed from before 2004and continue to be developed up to recent years. For industrial chemicals, most strategies developed concern PCB. For unintentional POPs, the development of such strategies started before 2004, but the majority of the reports indicate that these activities date from 2005 onwards.

Process indicator 8: Number of parties that have identified contaminated sites

487. 71 parties (39%) indicated that they have identified contaminated sites, 17 parties (9%) are currently doing so, and 34 parties (19%) report that sites have not been identified.

488. For pesticides, contaminated sites have been identified since before 2001 to recent years. For industrial chemicals, 17 parties indicated the identification of PCB contaminated sites and only a few indicated other types of chemicals.

489. Regarding the identification of sites contaminated with unintentional POPs, parties report having started activities as of before 2001 to recently.

Process indicator 9: Number of parties that have voluntarily undertaken remediation activities

490. 32 parties (18%) assert that they have voluntarily undertaken remediation activities, while 63 parties (35%) have not yet done so.

(c) Main findings

Measures for sound management of stockpiles and wastes

491. While some Parties have made progress in terms of developing strategies, measures and actions in the area of management of stockpiles and wastes, to identify stockpiles, products and articles in use, and wastes containing POPs, only a limited number of Parties report having such measures in place and even more limited information is available regarding the type of the measures or on the identification and disposal of wastes containing POPs.

Quantities of stockpiles and wastes managed in an environmentally sound manner

492. Quantitative information on stockpiles and POPs wastes being managed in an environmentally sound manner is limited, but sufficient to point to the need for further action. For PCB, only an estimated 17% of the total global mass has been eliminated.

493. Among the legacy POPs listed under the Convention, PCB and DDT are most often exported for final disposal, followed by toxaphene, dieldrin, and heptachlor. Most of the reported exports for POPs for final disposal were from developing country Parties or Parties with economies in transition to developed country Parties. Taking into account the information on ongoing use of PCB and DDT, it is possible that those chemicals will continue to be exported for final disposal in coming years.

494. Information is even more scarce for the newly listed POPs (BDEs and PFOS), as their identification in products is difficult, particularly in imported products. This makes it more challenging to follow the substance throughout its life cycle including its end of life management.

Contaminated sites

495. Identification and appropriate management of contaminated sites has been triggered by the Convention. 39% of the Parties to the Convention indicated they have identified contaminated sites, even though, according to the Convention's provisions, they are only required to endeavour to develop strategies to identify such sites. A limited number of Parties (18%) have voluntarily undertaken remediation activities, as these are not required by the Convention. When such remediation is undertaken, however, the Convention requires that it be done in an environmentally sound manner, and therefore Parties could benefit from help in developing competencies, cooperation and mobilization of resources to avoid further releases.

(d) Conclusions and recommendations

496. Due to the nature of wastes whereby most of the data collected are limited and restricted to a particular point in time in the life-cycle, and considering that wastes contain mixtures of substances, it is difficult to identify a specific quantity of wastes containing a specific POP which has been destroyed. In view of the limited data available, it is difficult to provide a quantitative global picture of wastes identified and destroyed over time, or otherwise disposed of, which is the major factor for assessing the effectiveness of this aspect of the Convention.

***Recommendation**: Data collection mechanisms for determining how much of specific POPs wastes has been destroyed or otherwise appropriately disposed of, should be improved, in particular through working more closely with the Basel Convention to give more focus to the work on POPs wastes inventories, through the Basel Convention's POPs Technical Guidelines and its national reports which are required to provide details on exports and imports for individual waste streams.*

497. According to estimates, only a limited proportion of known POPs wastes and stockpiles upon becoming wastes, in particular POPs pesticides and PCB, have been eliminated to date.

***Recommendation**: Parties need to accelerate their efforts for sound management of POPs stockpiles and wastes, including their further identification, and prepare plans of action that prioritize disposal of waste.*

C. Processes supporting control measures

1. Specific exemptions and notification of use (Article 4)

498. The outcome to be addressed in assessing the effectiveness of Article 4 is whether parties have transitioned to alternative products and processes within the allowed time period.

499. Two indicators have been identified for this outcome:

Process indicator 1 Process indicator 2	Number of parties who are registered for specific exemptions. Number of extensions that have been granted after the five-year exemption period.
Source of information for the indicators	The register.
Data limitations	It is assumed that parties have registered exemptions as required.
Baseline	The year in which the exemption came into effect

(a) Available information

500. The following information is available to enable assessment of the indicators:

Relevant COP decisions and processes

COP decisions	Title
SC-1/23	Format for the Register of Specific Exemptions
SC-1/24	Review process for entries in the Register of Specific Exemptions
SC-2/3	Review process for entries in the Register of Specific Exemptions
SC-3/3	Revised process for the review of entries in the Register of Specific Exemptions
SC-4/3	Exemptions
SC-5/8	Exemptions
SC-6/2	Exemptions
SC-7/1	Exemptions

Table C.1.1. *List of forms for notification of exemptions*

COP decisions	Title
SC-1/23, annex II	Form for notification of registration of a specific exemption
SC-1/25, annex II	Form for DDT registration
SC-5/8, annex I	Form for notification of specific exemptions
SC-5/8, annex II	Form for notification of specific exemptions for perfluorooctane

	sulfonate, its salts and perfluorooctane sulfonyl fluoride
SC-5/8, annex III	Form for notification of acceptable purposes for perfluorooctane sulfonate, its salts and perfluorooctane sulfonyl fluoride
SC-5/8, annex IV	Form for notification of a chemical as a constituent of articles manufactured or already in use
SC-6/2, annex	Form for notification of specific exemptions for technical endosulfan and its related isomers
UNEP/POPS/COP.2/30, annex III	Form for notification of closed-system site-limited intermediate

Table C.1.2. *Register on the website of the Stockholm Convention*

Register	**URL**
Specific exemptions for chemicals listed in Annex A	http://chm.pops.int/Implementation/Exemptionsandacceptablepurposes/RegisterofSpecificExemptions/ChemicalslistedinAnnexA/tabid/4643/Default.aspx
Specific exemptions for chemicals listed in Annex A	http://chm.pops.int/Implementation/Exemptionsandacceptablepurposes/RegisterofSpecificExemptions/ChemicalslistedinAnnexB/tabid/4644/Default.aspx
Acceptable purposes for DDT[1]	http://chm.pops.int/Implementation/Exemptionsandacceptablepurposes/RegistersofAcceptablePurposes/AcceptablePurposesDDT/tabid/456/Default.aspx
Acceptable purposes for PFOS, its salts and PFOSF[2]	http://chm.pops.int/Implementation/Exemptionsandacceptablepurposes/RegistersofAcceptablePurposes/AcceptablePurposesPFOSandPFOSF/tabid/794/Default.aspx
Notifications of Articles in use[3]	http://chm.pops.int/Implementation/Exemptionsandacceptablepurposes/NotificationsofArticlesinuse/tabid/452/Default.aspx
Notifications of Closed-system site-limited intermediates[4]	http://chm.pops.int/Implementation/Exemptionsandacceptablepurposes/NotificationsofClosedsystemsitelimitedinterm/tabid/453/Default.aspx
Expiration and withdrawal	http://chm.pops.int/Implementation/Exemptionsandacceptablepurposes/ExpirationandWithdrawal/tabid/4645/Default.aspx

1. A register of acceptable purposes for DDT is established in accordance with paragraphs 1 of Part II to Annex B of the Convention.
2. A register of acceptable purposes for PFOS, its salts and PFOSF is established under Part III of Annex B to the Convention.
3. The notifications of a chemical as a constituent of articles manufactured or already in use are made available to public in accordance with note (ii) of part I of both Annex A and B to the Convention.
4. The notifications of closed-system site-limited intermediate are made available to public in accordance with note (iii) of Part I of both Annex A and B to the Convention.

(b) Analysis of available information and application of the framework

501. The forms for the notifications of specific exemptions adopted by the Conference of the Parties have been used by parties. The register of specific exemptions is maintained by the Secretariat and made available to the public on the website in accordance with Article 4 and in the format agreed by the Conference of the Parties. The Secretariat also maintains the registers of acceptable purposes, notifications of articles in use and closed-system site limited intermediates.

Process Indicator 1: Number of parties who are registered for specific exemptions

502. The number of parties who are registered for specific exemptions as of 30 April 2016is detailed in the table below. A detailed analysis for each of the chemicals produced and/or in use according to specific exemptions under the Convention is provided in section II.B.1 of this report.

Table C.1.3. *Number of parties registered for specific exemptions*

Chemical	**Annex**	**Activity**	**Number of parties registered**
Aldrin	A	Use	0 (Expired)

Chemical	Annex	Activity	Number of parties registered
Chlordane	A	Production	0 (Expired)
		Use	0 (Expired)
Dieldrin	A	Use	0 (Expired)
Heptachlor	A	Use	0 (Expired)
Hexabromocyclododecane	A	Production	2
		Use	3
Hexabromodiphenyl ether and heptabromodiphenyl ether	A	Use	6 (including EU)
Hexachlorobenzene	A	Production	0 (Expired)
		Use	0 (Expired)
Lindane	A	Use	2
Mirex	A	Production	0 (Expired)
		Use	0 (Expired)
Polychlorinated biphenyls (PCB)	A	Use	May be exercised by all Parties in accordance with note (iv) of part I and part II of Annex A
Technical endosulfan (CAS No: 115-29-7) and its related isomers (CAS No: 959-98-8 and CAS No: 33213-65-9)	A	Production	1
		Use	3
Tetrabromodiphenyl ether and pentabromodiphenyl ether	A	Use	7 (including EU)
Perfluorooctane sulfonic acid (CAS No: 1763-23-1), its salts and perfluorooctane sulfonyl fluoride (CAS No: 307-35-7)	B	Production	1
	B	Use	2

503. In total, as at 30 April 2016, there are registrations of 27 specific exemptions from 12 Parties.

Process Indicator 2: Number of extensions that have been granted after the five-year exemption period.

504. As at 30 April 2016, no extensions of registrations of exemptions have been requested (and therefore none granted) after the five year exemption period. As a result, all registrations of specific exemptions available at the time of the entry into force of the Convention[47] expired with effect on 17 May 2009. In addition, following decision SC-7/1, no new registrations may be made for six types of specific exemptions[48] for the production and use of perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride.

505. As a further consideration, some parties have noted low notification rates for registration of specific exemptions, stating that this may be misleading given the relatively significant number of parties still using certain POPs that are still in commerce, including in products and articles (UNEP/POPS/COP.6/33). See for example decision SC 7/5, paragraph 3.

506. Information is also available in relation to parties transmitting notifications of chemicals as constituents of articles manufactured or already in use, as well as closed-system site-limited intermediates, pursuant to the provisions of Annexes A and B.

[47] Specific exemptions listed in Annex A pertaining to aldrin, chlordane, dieldrin, heptachlor, hexchlorobenzene, and mirex.

[48] Carpets, leather and apparel, textiles and upholstery, paper and packaging, coatings and coating additives, and rubber and plastics.

Table C.1.4. *Number of parties that notified a chemical as a constituent of articles manufactured or already in use pursuant to note (ii) of part I of both Annex A and B to the Convention*

Chemical	Number of parties registered
Chlordane	1
Heptachlor	1
Hexabromocyclododecane	1
Lindane	1
Hexabromodiphenyl ether and heptabromodiphenyl ether	2
Tetrabromodiphenyl ether and pentabromodiphenyl ether	2
Perfluorooctane sulfonic acid (CAS No: 1763-23-1), its salts and perfluorooctane sulfonyl fluoride (CAS No: 307-35-7)	4

Table C.1.5. *Number of parties that notified production or use of quantities of a chemical as a closed-system site-limited intermediate pursuant to note (iii) of part I of both Annex A and B to the Convention*

Chemical	Number of parties registered
DDT (Intermediate in production of dicofol)	1

507. The production and use of hexachlorobenzene in China, pursuant to note (iii) of part I of Annex A, and DDT in Brazil and China, pursuant to note (iii) of part I of Annex B ceased in May 2015.[49]

508. By decision SC-7/1, the Conference of the Parties noted that, on the basis of the notification submitted to the Secretariat by India on 10 March 2014, the production and use of DDT as a closed-system site-limited intermediate in the production of dicofol has been extended until 15 May 2024.As provided in note (iii) of part I of Annex A, the condition for this exemption is that "a Party, upon notification to the Secretariat, may allow the production and use of quantities of a chemical listed in that Annex as a closed-system site-limited intermediate that is chemically transformed in the manufacture of other chemicals that, taking into consideration the criteria in paragraph 1 of Annex D, do not exhibit the characteristics of persistent organic pollutants". Dicofol is under consideration by the POPs Review Committee. By decision POPRC-10/3, the Committee decided that the screening criteria specified in Annex D to the Convention have been fulfilled for dicofol.

(c) Main findings

509. The number of Parties registered for specific exemptions for chemicals in commerce is low. As information transmitted to the Secretariat on the production and use of these chemicals is very limited, it is highly probable that some Parties may be continuing to produce and use the chemicals listed in the Annexes to the Convention without registration for specific exemptions.

510. No extensions of registrations of specific exemptions have been granted to date after the five year exemption period. The lack of any request for extensions of registrations of specific exemptions could be an indicator of less reliance on POPs and of a transition to alternative products and processes within the allowed time period. It is also possible that not all Parties that are in need of such exemptions have notified to the Secretariat to register for those exemptions, thus making a request for an extension unnecessary.

511. Furthermore, it is important to note that several Parties have expressed a continued need for certain specific exemptions and that the Conference of the Parties continues to evaluate the continued need for chemicals for the various acceptable purposes and specific exemptions e.g. DDT; PFOS, its salts and PFOSF; and BDEs.

[49] Production and use of quantities of a chemical as a closed-system site-limited intermediate, in accordance with note (iii) of part I of both Annex A and B, shall cease after a 10-year period unless the party concerned submits a new notification to the Secretariat, in which case the period will be extended for an additional 10 years, unless the Conference of the Parties, after a review of the production and use, decides otherwise; the notification procedure can be repeated.

(d) Conclusions and recommendations

512. Parties must register for specific exemptions at the time they become bound to the Convention and/or its amendments, if such need is identified. The number of Parties registered for specific exemptions for the newly listed POPs in commerce is lower than expected and no extensions of registrations of specific exemptions have been requested to date. Failure to claim an exemption for a listed substance that is being utilized by a Party has the potential to constitute a large gap in the Convention's information base, and represents non-compliance with the Convention.

***Recommendation**: Awareness raising activities, such as webinars, immediately after the adoption of an amendment at a COP, should be routinely organized by the Secretariat in order to remind Parties about domestic actions necessary to implement their obligations within one year from the date of communication by the depositary of the amendment to Annexes A or B, including the need to assess whether they need to claim an exemption. Such webinars should include an explanation of why the claiming of exemptions is important to track not only overall effectiveness of the Convention's controls, but also the impact on other Parties' ability to enforce their laws on import of listed chemicals. Improving and even automating some aspects of communication with Parties (i.e. tracking and alert systems) could assist in making exemption reporting more meaningful and successful.*

2. Listing of chemicals in Annexes A, B and C (Article 8)

513. The outcome to be addressed in assessing the effectiveness of Article 8 is whether the review process is capable of identifying new POPs for listing in the annexes to the Convention as recommended by the Persistent Organic Pollutants Review Committee.

514. The successful implementation of this article is necessary to ensure that the Convention remains a living agreement and deals with substances known to have persistent organic pollutant properties. A success parameter is the completion of the review of chemicals and the eventual listing of new persistent organic pollutants.

515. One indicator has been identified for this outcome:

Outcome indicator 1	Percentage of the recommendations for listing chemicals of the Persistent Organic Pollutants Review Committee that have been adopted by the Conference of the Parties
Source of information for the indicator	Decisions of the Conference of the Parties.
Data limitations	None.
Baseline	Entry into force of the Convention

(a) Available information

516. The following information is available:

Relevant decisions by the Conference of the Parties

COP decisions	Title
SC-4/10	Listing of alpha hexachlorocyclohexane
SC-4/11	Listing of beta hexachlorocyclohexane
SC-4/12	Listing of chlordecone
SC-4/13	Listing of hexabromobiphenyl
SC-4/14	Listing of hexabromodiphenyl ether and heptabromodiphenyl ether
SC-4/15	Listing of lindane
SC-4/16	Listing of pentachlorobenzene
SC-4/17	Listing of perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride
SC-4/18	Listing of tetrabromodiphenyl ether and pentabromodiphenyl ether
SC-5/3	Listing of endosulfan
SC-6/13	Listing of hexabromocyclododecane
SC-7/12	Listing of hexachlorobutadiene
SC-7/13	Listing of pentachlorophenol and its salts and esters
SC-7/14	Listing of polychlorinated naphthalenes

Table C.2.1. *List of risk profiles and risk management evaluations adopted by the Persistent Organic Pollutants Review Committee*

Chemical	Document	Symbol
Alpha hexachlorocyclohexane	Risk profile	UNEP/POPS/POPRC.3/20/Add.8
	Risk management evaluation	UNEP/POPS/POPRC.4/15/Add.3
Beta hexachlorocyclohexane	Risk profile	UNEP/POPS/POPRC.3/20/Add.9
	Risk management evaluation	UNEP/POPS/POPRC.4/15/Add.4
Chlordecone	Revised risk profile	UNEP/POPS/POPRC.3/20/Add.10
	Risk management evaluation	UNEP/POPS/POPRC.3/20/Add.2
Hexabromobiphenyl	Risk profile	UNEP/POPS/POPRC.2/17/Add.3
	Risk management evaluation	UNEP/POPS/POPRC.3/20/Add.3
Hexabromodiphenyl ether and heptabromodiphenyl ether	Risk profile	UNEP/POPS/POPRC.3/20/Add.6
	Risk management evaluation	UNEP/POPS/POPRC.4/15/Add.1
Lindane	Risk profile	UNEP/POPS/POPRC.2/17/Add.4
	Risk management evaluation	UNEP/POPS/POPRC.3/20/Add.4
Pentachlorobenzene	Risk profile	UNEP/POPS/POPRC.3/20/Add.7
	Addendum to risk profile	UNEP/POPS/POPRC.4/15/Add.5
	Risk management evaluation	UNEP/POPS/POPRC.4/15/Add.2
Perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride	Risk profile	UNEP/POPS/POPRC.2/17/Add.5
	Risk management evaluation	UNEP/POPS/POPRC.3/20/Add.5
	Addendum to risk management evaluation	UNEP/POPS/POPRC.4/15/Add.6
Tetrabromodiphenyl ether and pentabromodiphenyl ether	Risk profile	UNEP/POPS/POPRC.2/17/Add.1
	Risk management evaluation	UNEP/POPS/POPRC.3/20/Add.1
Endosulfan	Risk profile	UNEP/POPS/POPRC.5/10/Add.2
	Risk management evaluation	UNEP/POPS/POPRC.6/13/Add.1
Hexabromocyclododecane	Risk profile	UNEP/POPS/POPRC.6/13/Add.2
	Risk management evaluation	UNEP/POPS/POPRC.7/19/Add.1
	Addendum to risk management evaluation	UNEP/POPS/POPRC.8/16/Add.3
Hexachlorobutadiene	Risk profile	UNEP/POPS/POPRC.8/16/Add.2
	Risk management evaluation	UNEP/POPS/POPRC.9/13/Add.2
Pentachlorophenol and its salts and esters	Risk profile	UNEP/POPS/POPRC.9/13/Add.3
	Risk management evaluation	UNEP/POPS/POPRC.10/10/Add.1
Polychlorinated naphthalenes	Risk profile	UNEP/POPS/POPRC.8/16/Add.1
	Risk management evaluation	UNEP/POPS/POPRC.9/13/Add.1
Decabromodiphenyl ether (commercial mixture, c-decaBDE)	Risk profile	UNEP/POPS/POPRC.10/10/Add.2

Table C.2.2. *Recommendations of the Persistent Organic Pollutants on listing of chemicals*

COP documents	Title
UNEP/POPS/COP.4/17	Recommendations of the Persistent Organic Pollutants Review Committee of the Stockholm Convention to amend Annexes A, B or C of the Convention
UNEP/POPS/COP.4/18	Draft text for amendments to Annexes A, B and/or C to the Stockholm Convention
UNEP/POPS/COP.5/17	Recommendation by the Persistent Organic Pollutants Review Committee of the Stockholm Convention to amend Annex A to the Convention and draft amendment text
UNEP/POPS/COP.6/17	Recommendation by the Persistent Organic Pollutants Review Committee to list hexabromocyclododecane in Annex A to the Stockholm Convention and draft text of the proposed amendment
UNEP/POPS/COP.7/18	Recommendation by the Persistent Organic Pollutants Review Committee to list chlorinated naphthalenes in Annexes A and C to the Convention and draft text of the proposed amendment
UNEP/POPS/COP.7/19	Recommendation by the Persistent Organic Pollutants Review Committee to list hexachlorobutadiene in Annexes A and C to the Convention and draft text of the proposed amendment
UNEP/POPS/COP.7/20	Recommendation by the Persistent Organic Pollutants Review Committee to list pentachlorophenol and its salts and esters in Annex A to the Convention and draft text of the proposed amendment

(b) Analysis of available information and application of the framework

517. The table below summarizes chemicals listed in Annexes A, B and/or C or under reviewed by the Persistent Organic Pollutants Review Committee:

Table C.2.3. *A summary of chemicals listed in Annexes A, B and/or C or under reviewed by the Persistent Organic Pollutants Review Committee*

	Chemical	Proposing party	COP decision/POPRC review	Entry into force
1	Alpha hexachlorocyclohexane	Mexico	Annex A	168 parties (94%)
2	Beta hexachlorocyclohexane	Mexico	Annex A	168 parties (94%)
3	Chlordecone	European Union	Annex A	168 parties (94%)
4	Hexabromobiphenyl	European Union	Annex A	167 parties (93%)
5	Hexabromodiphenyl ether and heptabromodiphenyl ether	European Union	Annex A with specific exemptions	167 parties (93%)
6	Lindane	Mexico	Annex A with specific exemptions	168 parties (94%)
7	Pentachlorobenzene	European Union	Annex A and Annex C	168 parties (94%)
8	Perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride	Sweden	Annex B with acceptable purposes and specific exemptions	167 parties (93%)
9	Tetrabromodiphenyl ether and pentabromodiphenyl	Norway	Annex A with specific exemptions	167 parties (93%)

	Chemical	Proposing party	COP decision/POPRC review	Entry into force
	ether			
10	Endosulfan	European Union	Annex A with specific exemptions	167 parties (93%)
11	Hexabromocyclododecane	Norway	Annex A with specific exemptions	159 parties (89%)
12	Hexachlorobutadiene	European Union	Annex A	0
13	Pentachlorophenol and its salts and esters	European Union	Annex A with specific exemptions	0
14	Polychlorinated naphthalenes	European Union	Annex A with specific exemptions and Annex C	0
15	Decabromodiphenyl ether (commercial mixture, c-decaBDE)	Norway	Risk profile adopted at POPRC-10	N/A
16	Dicofol	European Union	Annex D screening met at POPRC-10	N/A
17	Short-chained chlorinated paraffins	European Union	Annex D screening met at POPRC-2	N/A
18	Pentadecafluorooctanoic acid (CAS No: 335-67-1, PFOA, perfluorooctanoic acid), its salts and PFOA-related compounds	European Union	Proposal to be reviewed at POPRC-11	N/A

518. As of 30 April 2016, 18 chemicals were proposed for listing in Annexes A, B and/or C. Taking due account of the recommendations of the Persistent Organic Pollutants Review Committee, the Conference of the Parties decided to list 14 chemicals in the Annexes to the Convention. The percentage of the Committee's recommendations for listing chemicals that have been adopted by the Conference of the Parties is 100%. With regard to hexachlorobutadiene, the Committee recommended listing of the chemical in Annex A and C to the Convention, while the Conference of the Parties amended only Annex A to the Convention to list the chemical therein and requested the Committee to further review hexachlorobutadiene on the basis of the newly available information in relation to its listing in Annex C and to make a recommendation to the Conference of the Parties on listing hexachlorobutadiene in Annex C for further consideration at its eighth meeting. The Committee is currently reviewing four chemicals.

519. Since POPRC-4, the Committee has been considering at each of its meetings issues related to effective participation in the work of the Committee. At its ninth meeting, the Committee endorsed a series of practices and strategies in the evaluation of chemicals in accordance with Annex E to the Convention with a view towards seeking to improve the information in draft risk profiles.

520. At its tenth meeting, the Committee specifically addressed matters relevant to improving the quality of information in risk management evaluations and risk profiles. The importance of continuing to seek improvements in the quality, quantity, breadth and timeliness of information submitted by parties and observers, including industry observers, for consideration by the Committee in its preparation of draft risk profiles and draft risk management evaluations, was highlighted. That included addressing issues associated with the confidentiality of certain information, which posed a significant obstacle to the efficient evaluation of alternatives. It was recommended that both parties and industry should work to address those issues.

(c) Main findings

521. The operation of the process laid out in Article 8 for listing chemicals in Annexes A, B and/or C resulted in the listing of 14 additional chemicals in the Stockholm Convention over 11 years.

522. All the chemicals recommended by the POPs Review Committee for listing have been adopted by the Conference of the Parties. Up until the seventh meeting of the Conference of the Parties, all chemicals and related control measures were adopted by consensus. At its seventh meeting, when all efforts at achieving consensus were exhausted, as a last resort, the Conference of the Parties called for a vote for the first time ever on pentachlorophenol and its salts and esters, which, as a result of the vote, was listed under the Convention.

(d) Conclusions and recommendations

523. With the addition of 14 new substances to the list of legacy POPs globally banned or restricted under the Convention at the time it entered into force, the operation of the process for listing new substances in Annexes A, B and/or C can be considered successful. The recommendations for listing are made by the POPs Review Committee based on risk profiles and risk management evaluation documents. Those documents are prepared on the basis of available peer reviewed literature and the information and comments submitted by Parties and observers. There has recently been recognition of the need to seek improvements in the quality, quantity, breadth and timeliness of information submitted by Parties and observers, for consideration by the Committee during its preparation of draft risk profiles and draft risk management evaluations.

***Recommendation**: Parties and observers should provide adequate and timely information to the Secretariat for the use of the POPs Review Committee to support it in the development of sound supporting documents and recommendations to the Conference of the Parties on the listing of new substances.*

D. Enhancing understanding

1. Information exchange (Article 9)

524. The outcome to be addressed in assessing the effectiveness of Article 9 is whether parties have access to the information that they need on persistent organic pollutants and persistent organic pollutant-related issues, and whether that information has helped them to meet their obligations under the Convention.

525. Given the diverse and often informal methods used to disseminate information, it is very difficult to measure the impact of information exchange measures. Obtaining comparable data on outcome indicators or specific activities on a global scale would require a coordinated approach and significant investment. No outcome indicator has therefore been included for this element.

526. Four process indicators have been identified for this outcome:

Process indicator 1 Process indicator 2	Number of parties with designated national focal points and official contact points Number of parties that have established information exchange mechanisms
Source of information for the indicators	Section VII of part B of the national reports and the Secretariat
Data limitations	None.
Baseline	Entry into force of the Convention.
Process indicator 3	Number of parties and intergovernmental and non-governmental organizations that have submitted information on persistent organic pollutants and persistent organic pollutant-related issues through the clearing-house mechanism
Source of information for the indicator	Secretariat
Data limitations	None.
Baseline	Period of first evaluation.
Process indicator 4	Number of parties participating in information exchange activities organized by regional centres
Source of information for the indicator	Regional centres
Data limitations	None
Baseline	Entry into force of the Convention

(a) Available information

Relevant COP decisions and processes

SC-2/17: Clearing-house mechanism	Approves the pilot-phase information-exchange activities
SC-3/10: Information exchange	Approves the activities for the first phase of implementation of the clearing-house mechanism
SC-4/21: Information exchange	Requests the Secretariat to prepare a revised workplan for the activities of the clearing-house mechanism, covering all three conventions
SC-5/15: Information exchange	Decides that all new phases in the development of the clearing-house mechanism functions relating to the Stockholm Convention should be implemented as part of the development of the clearing-house mechanism serving the Basel, Rotterdam and Stockholm conventions
SC-7/29: Clearing-house mechanism for information exchange	Acknowledges the role that the joint clearing-house mechanism can play in facilitating the exchange of information in relation to the sound management of chemicals and wastes among parties and other stakeholders and in promoting the understanding of scientific, technical and legal aspects of the three conventions

527. Sources of information reviewed for this evaluation include the national focal points (NFP)and official contact points (OCP)nomination forms submitted to the Secretariat, the national reports submitted pursuant to Article 15 from either the third, second, first national reports, national implementation plans (NIPs), various reports extracted from the Secretariat information systems, and the activity reports submitted by SCRC regional centres.

(b) Analysis of available information and application of the framework

Process Indicator 1: Number of parties with designated national focal points and official contact points

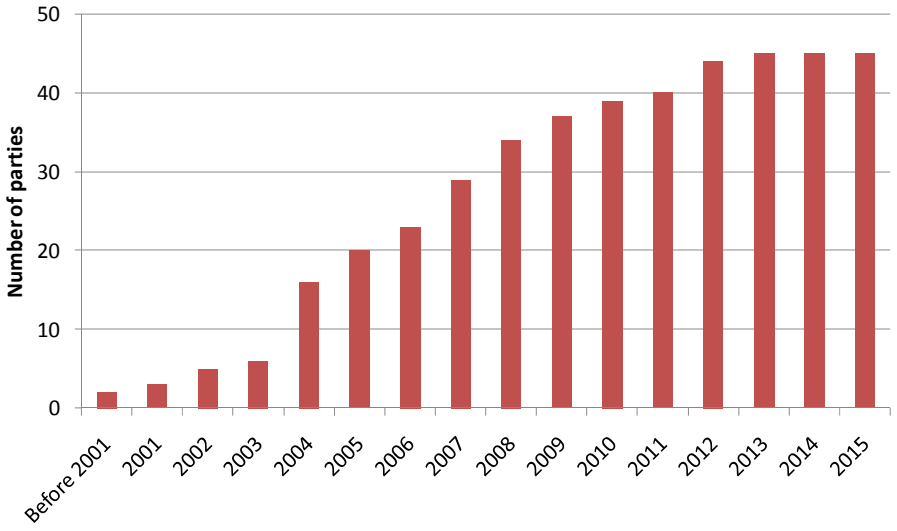
528. As of 30 April 2016, 139 out of the 180 parties to the Convention (77%) have designated at least one national focal point (and/or OCP).

Process Indicator 2: Number of parties that have established information exchange mechanisms

529. As of 30 April 2016, of the 180 parties to the convention, 85 (47%) provide information on having established information exchange mechanisms. Information on the years in which parties have established such mechanisms is available from 45 parties.

530. The cumulative number of parties having established information exchange mechanisms in specific years is presented in figure D.1.1 below[50]. The entry into force of the Convention in 2004 is shown to have triggered development of POPs information exchange mechanisms in countries.

Figure D.1.1. *Number of parties with information exchange mechanisms contributing to Article 9*



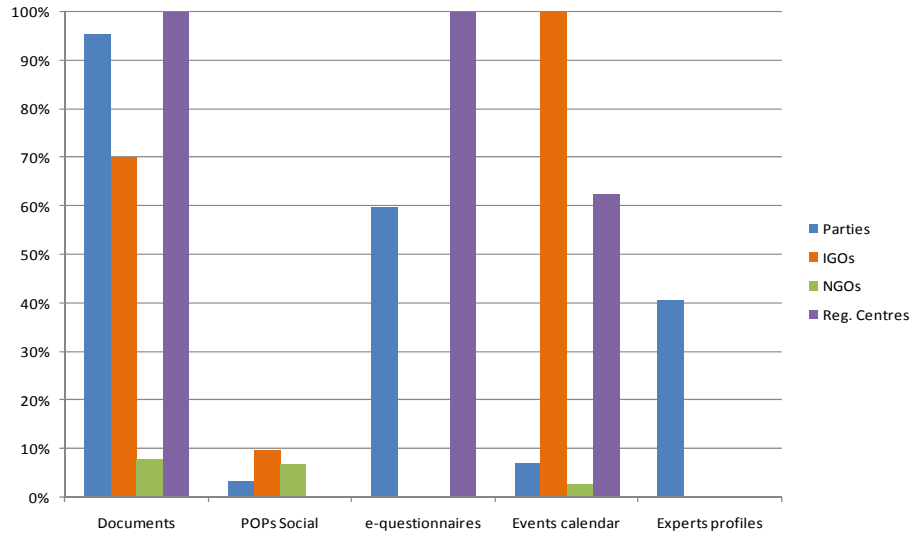
[50] A number of parties report having taken action contributing to the implementation of Article 9 prior to the entry into force of the Convention, as of before 2001.

Process Indicator 3: Number of parties and intergovernmental and non-governmental organizations that have submitted information on persistent organic pollutants and persistent organic pollutant-related issues through the clearing-house mechanism

531. Significant progress has been made in the implementation of the clearing-house mechanism. As of 2015, new information systems have been developed including a joint calendar, joint contact and expert database, joint scientific and technical publications, webinar library and online reporting. These have resulted in significant enhancements to the Basel, Rotterdam and Stockholm Conventions' websites and knowledge management capacity.

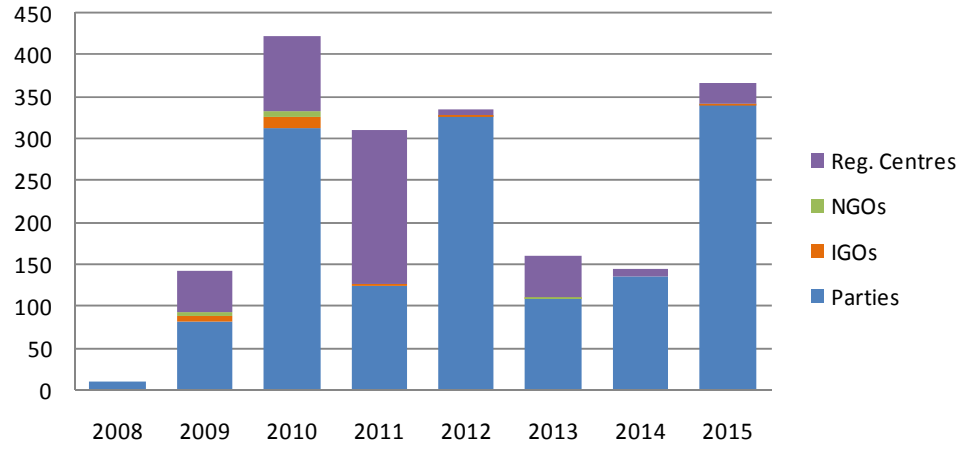
532. Several groups of contributors have submitted information through the clearing-house mechanism as outlined in the figure below (subject to various calls for information pursuant to decisions of the Conferences of the Parties and subsidiary bodies). A majority of parties, regional centres and intergovernmental organizations are actively participating in information exchange activities through the clearing-house mechanism, but currently, only a minority of non-governmental organizations listed as accredited observers to the Conference of the Parties are contributing.

Figure D.1.2. *Proportion of community members having submitted information by category and media (annual average over the period 2013-2015)*



533. The volume of information exchanged through the clearing-house mechanism is represented in the figure below. No distinct trend can be observed over the period 2008-2015 and no pattern among COP and non-COP years. With an average of 181 documents submitted per year, parties are the main clearing-house mechanism contributors. The information submitted is accessed over the internet by a stable number of visitors with an average of 165,054 visits per year. The number of visits per year remained constant around this average over the period 2013-2015.

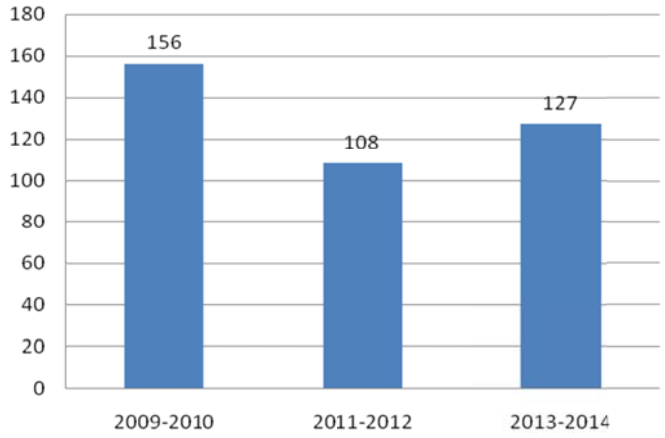
Figure D.1.3. *Number of documents submitted by stakeholders and year*



Process Indicator 4: Number of parties participating in information exchange activities organized by regional centres

534. Based on activity reports submitted by regional centres, 156 parties (87%) have participated in at least one information exchange activity organized by regional centres since 2009.The evolution over time of parties participating in information exchange activities organized by regional centres can be seen below.

Figure D.1.4. *Trends in parties' participation in information exchange activities organized by regional centres*



(c) Main findings

535. Progress has been achieved through the ongoing work on a clearing-house mechanism for the Basel, Rotterdam and Stockholm conventions. As of 2015, new information systems have been developed including a joint calendar, joint contact and expert database, joint scientific and technical publications, webinar library and online reporting serving the three conventions, resulting in significant enhancements to the conventions' websites and knowledge management capacity.

536. Most Parties have established information exchange processes with the Secretariat and nominated national focal points. As a result, a majority of Parties and regional centers are actively contributing to the clearing-house mechanism by submitting information to the Secretariat. This information is then accessed by a fair number of stakeholders through the clearing-house mechanism.

537. A majority of Parties are also engaged in information exchange activities with the regional centers. However, the nature, scope, quality, reach and impact of those information exchange activities are not specified and therefore a full analysis of the extent to which the objectives of the Convention are being met, is not possible.

(d) Conclusions and recommendations

538. The provisions of Article 9, particularly nomination of national focal points and the establishment of the clearing-house mechanism, have contributed to increased information exchange and awareness on POPs issues globally. A majority of stakeholders are actively contributing to the clearing-house mechanism.

***Recommendation**: Parties should continue to exchange information through the clearinghouse mechanism. User surveys on the content, quality and impact of information exchange activities could be performed. Such surveys should be conducted in a cost efficient way e.g. through online questionnaires.*

2. Public information, awareness and education (Article 10)

539. The outcomes to be addressed in assessing the effectiveness of Article 10 are the extent to which the public and stakeholders enjoy access to information on the effects of persistent organic pollutants and their sound management and alternatives and whether public awareness of persistent organic pollutant issues has improved.

540. Public awareness is an important factor for the effective implementation of the Convention. Obtaining comparable data on outcome indicators or specific activities on a global scale would, however, require a coordinated approach and significant investment. No outcome indicator has therefore been included for this element.

541. Three indicators been identified for this outcome:

Process indicator 1 Process indicator 2	Number of parties that have taken measures to implement article 10. Average number of measures under paragraph 1 of Article 10 that are being implemented by parties
Source of information for the indicators	Section VIII of part B of the national reports**.**
Data limitations	Data that are captured within the national reports are qualitative, giving only an indication.
Baseline	Entry into force of the Convention
Process indicator 3	Number of parties participating in public information, awareness and education activities organized by regional centres
Source of information for the indicator	Regional centres
Data limitations	None
Baseline	Entry into force of the Convention

(a) Available information

542. Sources of information reviewed are the national reports submitted pursuant to Article 15 from either the third, second, first cycles, national implementation plans (NIPs), various reports extracted from the Secretariat information systems, and the activity reports submitted by SCRC regional centres.

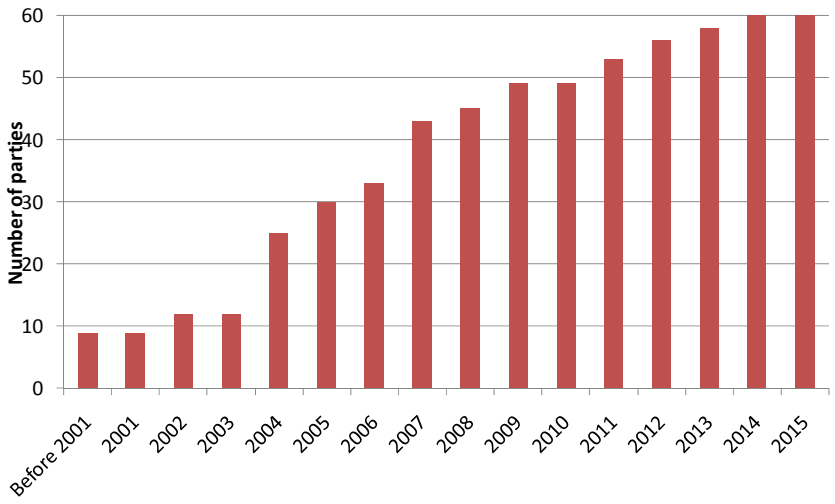
(b) Analysis of available information and application of the framework

Process Indicator 1: Number of parties that have taken measures to implement article 10.

543. Among the 180 parties to the convention, 107 parties report having taken measures to implement Article 10, representing an overall 59%. The year during which parties have initiated such measures is reported by 60 parties.

544. The cumulative number of parties taking measures to implement Article 10 according to the year can be seen in the figure below[51]. While some parties had taken such measures before the Convention was adopted in 2001, more parties have begun taking such measures as of 2004, the year of entry into force of the Convention, and since then, there is an increase in the overall number of parties having developed such measures.

Figure D.2.1. *Number of parties having taken measures to contribute to Article 10*

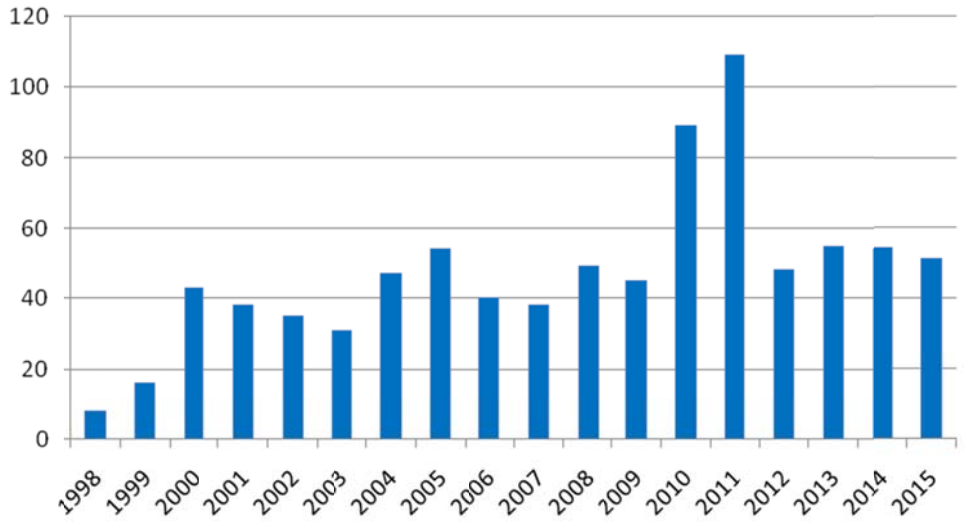


545. Through such initiatives spreading widely at the global level, such as the Chemical Information Exchange Network,awareness on the issue of POPs has increased over time, as also demonstrated by measurements showing decreasing trends of concentrations of POPs in the environment and in humans (see section II.A.1 of this report).

[51] A number of parties report having taken action contributing to the implementation of Article 10 prior to the entry into force of the Convention, as of before 2001.

546. Figure D.2.2 shows the progression over time in the number of articles dealing with POPs published by 25 news websites worldwide. As of 2000, the number of articles published every year in the press is on the rise.

Figure D.2.2. *Number of articles relevant to POPs published online by 25 selected news websites around the world*[52]



Process Indicator 2: Average number of measures under paragraph 1 of Article 10 that are being implemented by parties

547. Seven specific measures are specified under paragraph 1 of Article 10, namely:

(a) Awareness among policy and decision makers with regard to POPs;

(b) Provision to the public of all available information on POPs;

(c) Development and implementation, especially for women, children and the least educated, of educational and public awareness programmes on POPs, as well as on their health and environmental effects and on their alternatives;

(d) Public participation in addressing POPs and their health and environmental effects and in developing adequate responses, including opportunities for providing input at the national level regarding implementation of this Convention;

(e) Training of workers, scientists, educators and technical and managerial personnel;

(f) Development and exchange of educational and public awareness materials at the national and international levels;

(g) Development and implementation of education and training programmes at the national and international levels.

548. The average number of measures taken is 5, out of a maximum of 7 reported. Only 8 parties report implementing all 7 measures. The measures specified in (a), (b), and (e) above are those most implemented by parties. Measures (g) and (c) are least implemented.

Process Indicator 3: Number of parties participating in public information, awareness and education activities organized by regional centres

549. A total of 128 parties participated in at least one public information, awareness and education activities organized by regional centres. This represents 71% of the total number of parties as of 30 April 2016.

[52] El Universal, El País, El Mundo, El Tiempo, Estadao, Le Figaro, Le Monde, L'Express, Le NouvelObservateur, NBC news, The NewYork Times, The Washington Post, The Washington Times, The Guardian, Independent, ABC News, All Africa, News 24, Asia Times, The Hindu, The Times of India, The Indian Express, China Daily, Dawn, PhilStar.

(c) Main findings

550. There has been an increase in the number of Parties having taken measures regarding public information, awareness and education. While some Parties had taken such measures before the Convention was adopted in 2001, more Parties, particularly those that are developing country Parties and Parties with economies in transition, have adopted such measures post entry into force of the Convention.

(d) Conclusions and recommendations

551. The Convention has clearly triggered action by Parties on public information, awareness and education. Through such initiatives spreading widely at the global level, such as the Chemical Information Exchange Network, awareness on the issue of POPs has increased over time, as also demonstrated by measurements showing decreasing trends of concentrations of POPs in the environment and in humans.

***Recommendation**: Parties should continue to implement activities targeted at increasing public information, awareness and education on POPs, including as new POPs are being listed in accordance with Article 8. More focus on the activities directed towards public and educational institutions should be encouraged and monitored.*

3. Research, development and monitoring (Article 11)

552. The outcome to be addressed in assessing the effectiveness of Article 11 is whether parties have undertaken research, development, monitoring and cooperation pertaining to persistent organic pollutants, candidate persistent organic pollutants and alternatives, and whether those activities have assisted parties to better fulfil their obligations under the Convention.

553. An indicator for this element could be the number of initiatives by parties to implement Article 11, including research, development, including best practices and techniques, or monitoring of environment and health. It is recognized that monitoring and assessment activities contributing to the global monitoring plan are relevant to the implementation of this article and that the regional and global monitoring reports can provide information that is relevant to the evaluation. Given the difficulty of accurately assessing the effect of the information produced by various initiatives in contributing to the parties' fulfilment of their obligations, no outcome indicator has been included for this question.

554. Three indicators have been identified for this question:

Process indicator 1 Process indicator 2	Number of parties that report undertaking research and development initiatives to implement Article 11 Number of items under paragraph 1 of Article 11 that are being implemented by parties
Source of information for the indicators	Section IX of part B of the national reports.
Data limitations	Data that are captured in national reports are qualitative, giving only an indication.
Baseline	Entry into force of the Convention.
Process indicator 3	Number of parties that report monitoring of persistent organic pollutants in humans and the environment
Source of information for the indicator	Section IX of part B of the national reports**.**
Data limitations	Information on level of effort is mostly qualitative.
Baseline	Entry into force of the Convention

(a) Available information

555. The sources of information for assessing these indicators are information contained in the national reports submitted by parties pursuant to Article 15 and in the NIPs, supplemented by various other resources such as the global monitoring report developed by the coordination group for the global monitoring plan, information concerning submissions by parties to various scientific / technical processes on risk profiles and risk management evaluations, number of scientific publications on POPs, and others.

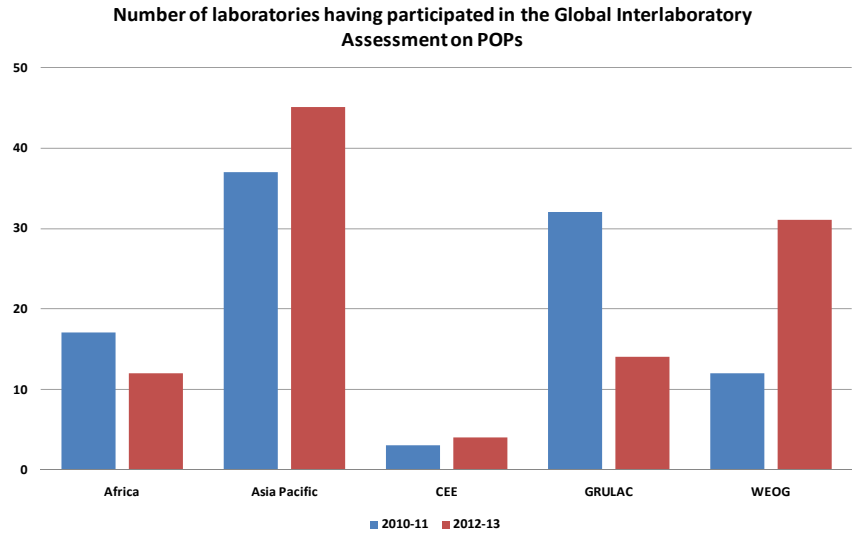
(b) Analysis of available information and application of the framework

Process indicator 1: Number of parties that report undertaking research and development initiatives to implement Article 11

556. 86 parties (48%) report undertaking research and development initiatives to implement Article 11. For developing country parties, the activities include predominantly participation in global monitoring plan relevant projects.

557. Capacity building activities conducted in the frame of the GMP enabled developing country parties to fully participate in the effectiveness evaluation. Overall, 101nationallaboratories participated in two inter-laboratory assessments conducted through UNEP DTIE in 2010-2011 and 106 in 2012-2013, as reflected below:

Figure D.3.1. *Number of laboratories participating in the Global Interlaboratory Assessment on POPs*



Process indicator 2: Average number of items under paragraph 1 of Article 11 that are being implemented by parties

558. Paragraph 1 of Article 11 specifies the following areas for research, development, monitoring and cooperation:

(a) Sources and releases into the environment;

(b) Presence, levels and trends in humans and the environment;

(c) Environmental transport, fate and transformation;

(d) Effects on human health and the environment;

(e) Socio-economic and cultural impacts;

(f) Release reduction and/or elimination;

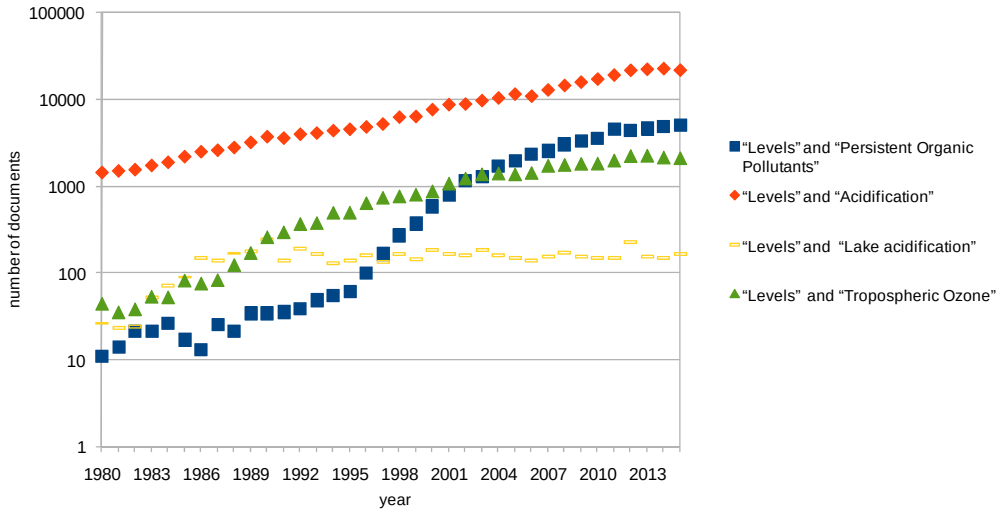
(g) Harmonized methodologies for making inventories of generating sources and analytical techniques for the measurement of releases.

559. Parties report research and development activities being taken mainly on items (a) and (b), and to a lesser extent on items (e) and (c). The average number of items is 5 per country.

560. The principal challenges in undertaking research and monitoring pursuant to Article 11 are as follows (in order of relevance): inadequate financial capacity, human resources, technical capacity, and institutional or policy frameworks.

561. According to the 2015 global monitoring report, since its entry into force, the Stockholm Convention has undoubtedly catalyzed POPs research and monitoring activities worldwide. An indication of this can be found for instance in a significant increase in the number of scientific articles on the topic over the last three decades. In the period 1980-2014, the number of articles relevant to "levels" of "persistent organic pollutants", increased significantly in the mid-1990s further to the adoption of two major treaties to protect human health and the environment from these chemicals: CLRTAP and the Stockholm Convention. Figure D.3.2 shows that by comparing over the same period the articles relevant to POPs and those on “acidification”, “lake acidification” and “tropospheric ozone”, which are domains of academic research for which an “electronic presence” bias would apply to the same degree as to POPs, it can be seen that the POPs series behaves differently with a clear increase around 1998 that is not visible in the other series. This can be attributed to the LRTAP POPs protocol (1998) and the Stockholm Convention (2001/2004).

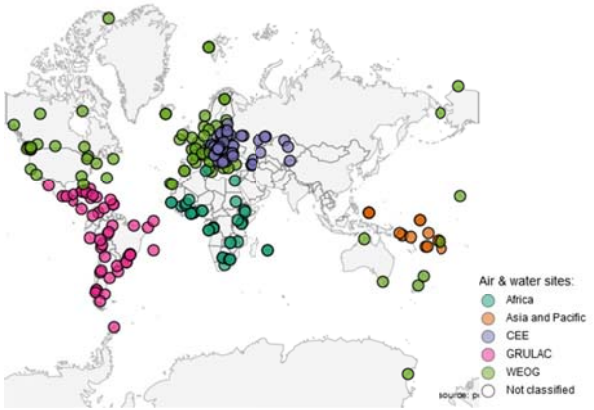
Figure D.3.2. *Number of articles relevant to "levels" of "persistent organic pollutants" over the period 1980-2014 (Source: Google scholar, March 2016)*



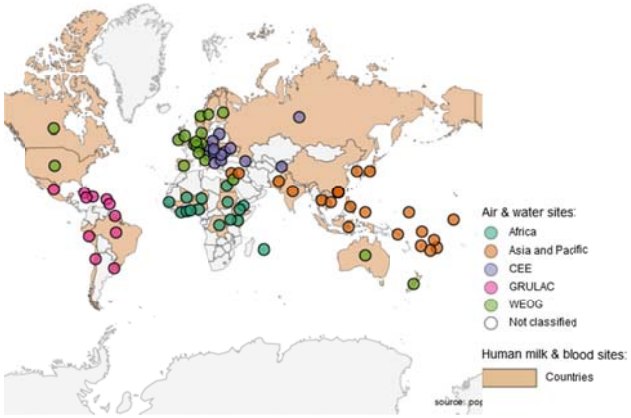
562. Through the existing air monitoring network including newly initiated programmes, the ongoing human exposure studies, and the initial water sampling activities under the GMP, better spatial coverage of POPs concentrations in the environment and in human populations has been achieved. In the initial stages of the GMP, long term POPs monitoring programmes were available only in countries of the Western European and Others Group Region (WEOG) and in Japan. Through ongoing strategic partnerships with well established monitoring programmes, data became available from all regions of the world (see section II.A.1).

Figure D.3.3. *Data availability in the second phase of the GMP: (a) air - active sampling; (b) air – passive sampling; (c) human milk; (d) water.*

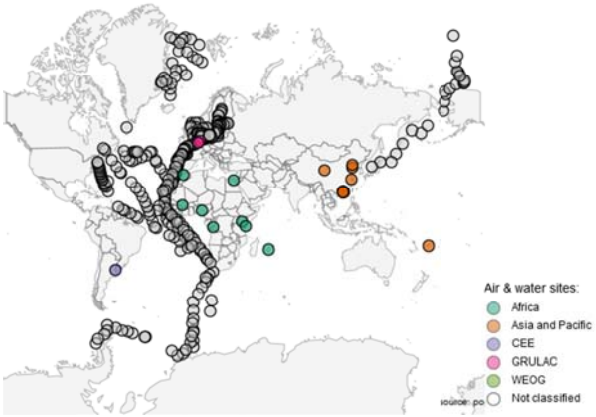
(a) Air monitoring: active sampling



(b) Air monitoring: passive sampling



(c) UNEP/WHO human milk survey



(d) Sampling of PFOS in water

(c) Main findings

563. Research and development initiatives on POPs have clearly been triggered worldwide by the Convention. A significant increase in the number of scientific articles on the topic can be observed over the last three decades further to the adoption of two major treaties to protect human health and the environment from these chemicals: the Aarhus Protocol on POPs under the CLRTAP and the Stockholm Convention.

564. In the case of developing country Parties, capacity building activities conducted in the frame of the global monitoring plan enabled activities related to the identification of the presence, levels and trends in humans and the environment and environmental transport, fate and transformation. Through providing inventory guidance, the Convention also worked towards global identification of sources and releases of POPs into the environment.

(d) Conclusions and recommendations

565. Since its entry into force, the Stockholm Convention has, without any doubt, acted as a catalyst for POPs research, monitoring and modelling activities worldwide. The Convention has also been successful in bringing together research findings from around the world, and enhanced awareness and knowledge about POPs. Capacity building activities have been mobilized to enable Parties to conduct research and monitoring on POPs and therefore enable effective participation of developing country Parties, including at the regional level, in the process for effectiveness evaluation. There is a need for sustained capacity building activities to strengthen national scientific and technical research capabilities in developing country Parties.

***Recommendation**: Research, monitoring, modelling, risk evaluation and data sharing should be sustained in the long term, and even enhanced in developing country Parties, including at the regional level, to advance national and regional capacities. Capacity building activities to strengthen national scientific and technical research capabilities in developing country Parties should be sustained.*

E. Support for implementation

1. Technical assistance and financial resources (Articles 12–14)

566. The outcomes to be addressed in assessing the effectiveness of Articles 12–14 are:

(a) Whether timely and appropriate technical assistance has been made available to developing-country parties and parties with economies in transition to enhance their capacity to implement the Convention;

(b) Whether timely and appropriate technology transfer has been made available to developing-country parties and parties with economies in transition to enhance their capacity to implement the Convention;

(c) Whether developing-country parties and parties with economies in transition have received financial resources to meet the incremental costs of implementing measures to fulfil their obligations under the Convention;

(d) Whether the network of regional centres proved effective in facilitating capacity-building, technical assistance and technology transfer to assist developing-country parties and parties with economies in transition.

567. Fourteen indicators have been identified for these outcomes. Many of the indicators are helpful in assessing these outcomes, but it should be noted that the work undertaken in the context of the review of the financial mechanism undertaken under paragraph 8 of Article 13 could inform these indicators or vice versa.

Process indicator 1	Total monetary value of financial resources, including technical assistance, provided
Process indicator 2	Total monetary value of financial resources, including technical assistance received
Process indicator 3	Number of parties providing technical assistance and financial resources
Process indicator 4	Number of parties requesting technical assistance and financial resources
Process indicator 5	Number of parties receiving technical assistance and financial resources
Process indicator 6	

Process indicator 7	Total monetary value of technology transfer provided
Process indicator 8	Total monetary value of technology transfer received
Process indicator 9	Number of parties providing technology transfer
Process indicator 10	Number of parties requesting technology transfer
Process indicator 11	Number of parties receiving technology transfer
Process indicator 12	Number of initiatives regional centres have undertaken
Process indicator 13	Total monetary value of technical assistance provided by regional centres
Process indicator 14	Number of parties that mobilized national resources for implementing the Convention
	Total monetary value of national financial support and incentives for implementing the Convention
Source of information for the indicators	Sections X and XI of part B of the national reports. Reports from the Secretariat on the implementation of Articles 12–14. Reports from the entity entrusted with administering the financial mechanism. Reports from the regional centres. Executive summaries of needs assessments and national implementation plans, as per decision SC-5/22, paragraphs 8–10
Data limitations	Data available may not readily provide information on the degree to which technical assistance and technology transfer have met parties' needs. National reports may need to be revised to capture more detailed information to support evaluation of the questions. The Conference of the Parties may wish to consider other measures to collect relevant data.
Baseline	Entry into force of the Convention

(a) Available information

Relevant COP decisions and processes

SC-1/9: Guidance to the financial mechanism	Adopts the guidance to the financial mechanism
SC-1/11: Memorandum of understanding between the Conference of the Parties and the Council of the Global Environment Facility	Adopts the memorandum of understanding between the Conference of the Parties and the Council of the Global Environment Facility
SC-1/15: Technical assistance	Adopts the Guidance on technical assistance and requested the Secretariat to report on progress in application of the guidance on technical assistance to each meeting of the Conference of the Parties
SC-2/9: Technical assistance	Adopts the Terms of Reference for the regional centres and the criteria for the evaluation of their performance
SC-2/10: Financial resources and mechanism	Welcomes the report on the first review of the financial mechanism and notes its recommendations and welcomes the achievements of the Global Environment Facility in support of the Convention and notes that the report of the first review of the financial mechanism is in general appreciative of the role of the Global Environment Facility as the principal entity of the financial mechanism of the Convention
SC-3/12: Technical assistance	Adopts the Terms of Reference for the selection of the regional centres

SC-4/22: Technical assistance	Requests the Secretariat to make full use of regional centres to implement its programme and submit a report on the application of the guidance Asks regional centres to undertake work on monitoring, diagnosis, technical analysis, information gathering and identification of techniques to eliminate and dispose of POPs
SC-4/24: Needs assessment	Takes note of the report by the Secretariat on the assessment of funding needs of Parties that are developing countries or countries with economies in transition to implement the provisions of the Convention over the period 2010–2014
SC-4/26: Review of the financial mechanism	Welcomes the positive report on the second review of the financial mechanism, noting in particular the significant contribution of the Global Environment Facility since the Convention was adopted
SC-5/20: Technical assistance	Requests the Secretariat to include, in the report on progress in the application of the guidance on technical assistance and transfer of environmentally sound technology, an analysis of obstacles and barriers to gaining access to technical assistance and technology transfer and recommendations on how to overcome them, based on information to be provided by Parties Invites the Stockholm Convention regional centres to develop and regularly update a list of technologies available to be transferred to developing-country parties and parties with economies in transition
SC-6/15: Technical assistance	Requests the Secretariat to prepare a report concerning: Progress in the application of the guidance on technical assistance, taking into account, in particular, the needs identified by parties in national implementation plans, national reports and any information collected regarding technical assistance and technology transfer needs or technical assistance and technology transfer available Progress in the implementation of its technical assistance programme Means to address the obstacles and barriers to technology transfer
SC-6/17: Needs assessment	Takes note of the report by the Secretariat on the assessment of funding needs of parties that are developing countries or countries with economies in transition to implement the provisions of the Convention over the period 2015–2019
SC-6/19: Third review of the financial mechanism	Welcomes the report on the third review of the financial mechanism
SC-7/21: Additional guidance to the financial mechanism	Welcomes the establishment of the Global Environment Facility chemicals and waste focal area, its strategy and the increased funds allocated for chemicals and waste and encourages the Facility to continue to enhance synergies in its activities, taking into account the co-benefits for the Basel and Rotterdam conventions and the Strategic Approach to International Chemicals Management, while first addressing the needs of the Stockholm Convention; Notes with concern that there is no increase in funding for the Stockholm Convention under the sixth replenishment of the trust fund of the Global Environment Facility; Notes the evolving funding needs of developing countries and countries with economies in transition to implement the

	Stockholm Convention and the chemicals and waste agenda and reaffirms the request to the Global Environment Facility to respond in that regard;
SC-7/22: Implementation of the integrated approach to financing	Joins the United Nations Environment Assembly of the United Nations Environment Programme in welcoming an integrated approach to addressing the financing of the sound management of chemicals and wastes

568. The sources of information for assessing these indicators are information contained the national reports submitted by parties pursuant to Article 15, financial reports of the Secretariat submitted to the Conference of the Parties, the third review of the financial mechanism, budget decisions adopted by the COPs, the reports submitted by the Global Environment Facility to the Conference of the Parties, the GEF project database, Secretariat internal information, and others.

569. The Convention envisages that technical assistance may be provided bilaterally between Parties, but also that the Parties establish arrangements for the purpose of providing technical assistance and promoting the transfer of technology relating to the implementation of the Convention. These arrangements are to include regional and subregional centres for capacity-building and transfer of technology to assist developing country Parties and Parties with economies in transition to fulfil their obligations under the Convention.

(b) Analysis of available information and application of the framework

570. The analysis relevant to technical assistance and financial resources is presented separately as follows:

(a) The first sub-section covers issues under Article 12 on technical assistance (indicators 3, 4, 5, 8, 9, 10, 11);

(b) The second sub-section covers those under Articles 13 and 14 on the financial mechanism and financial resources (indicators 1, 2, 3, 4, 5, 6, 7, 12, 13, 14).

(c) Technical Assistance (Article 12)

Process indicator 3: Number of parties providing technical assistance

571. In 2008, 15 parties had provided technical assistance to another party in accordance with Article 12. Out of these 15 Parties, 9 were in WEOG, 4 in CEE, 2 in Asia (UNEP/POPS/COP.4/29).

572. In 2011, 16 parties had provided technical assistance to another party in accordance with Article 12 (UNEP/POPS/COP.5/29).

573. In 2014, 12partieshad provided technical assistance to another party in accordance with Article 12 (UNEP/POPS/COP.7/INF/36).

574. That same year, 11 developed country parties and others participated in the survey on technical assistance, out of which 64% indicated their willingness to provide technical assistance to other parties (UNEP/POPS/COP.7/INF/15).

575. Technical assistance activities provided through webinars are listed under process indicator 5.

Process indicator 4: Number of parties requesting technical assistance

576. A total of 36 developing country parties and parties with economies in transition replied to the survey on technical assistance needs carried out in 2014: 16 parties in Africa, 4 in Asia/Pacific, 9 in CEE and 7 in Latin America and the Caribbean. General priority areas across all regions include: legal and institutional framework, unintentionally produced POPs, national implementation plans, stockpiles and wastes and industrial chemicals as intentionally produced POPs (UNEP/POPS/COP.7/INF/15).

577. The table below shows the five general priority areas for assistance for all four regions as well as overall regional priorities.

Table E.1.1. *Priority areas for technical assistance per UN region*

Priority areas	**Africa**	**Asia and Pacific**	**Central and Eastern Europe**	**Latin America and Caribbean**	**All regions**
National implementation plan (data collection, priority setting, multistakeholder coordination)	**17.7%**	**12.5%**	**16.7%**	**10.7%**	**15.44%**
National coordination	1.6%	6.25%	3.33%	0%	2.2%
Legal and institutional frameworks	**17.7%**	**18.75%**	**23.3%**	**10.7%**	**17.7%**
Regional cooperation among NFPs or Official Contact Points	4.8%	0%	0%	3.57%	2.9%
Intentionally produced POPs: pesticides with exemptions (Endosulfan, Lindane, DDT : collecting data, inventories, awareness raising, regulation)	3.2%	0%	3.33%	7.14%	3.7%
Intentionally produced POPs: industrial chemicals with exemptions (PFOS, PentaBDE, OctaBDE, HCBD: collecting data and inventories, regulation and control)	9.7%	**18.75%**	**16.7%**	**21.43%**	**14.7%**
Intentionally produced POPs: POPs for which no specific exemptions are available	4.8%	0%	0%	7.14%	3.7
Unintentionally produced POPs (implementing BAT/BEP, updating/revising inventories)	**16.1%**	**12.5%**	**16.7%**	**17.86%**	**16.2%**
Stockpiles and wastes (identifying contaminated products and articles in use, remediating sites)	**12.9%**	**18.75%**	**13.33%**	**17.86%**	**14.7%**
Supporting the work of the POPs Review Committee	1.6%	6.25%	3.33%	0%	2.2%
National report	9.6%	6.25%	3.33%	3.57%	6.6%

Process indicator 5: Number of parties receiving technical assistance

578. In 2008, 12 parties reported that they had received technical assistance pursuant to Article 12 (UNEP/POPS/COP.4/29). In 2011, 13 parties reported that they had received technical assistance pursuant to Article 12 (UNEP/POPS/COP.5/29). In 2014, 11 parties had reported having received technical assistance in accordance with Article 12 (UNEP/POPS/COP.7/INF/36).

579. From May 2013 to December 2014, technical assistance activities carried out by the secretariat included:

(a) 87 webinars, out of which 37 were on issues pertaining to the Stockholm Convention and 52 on cross-cutting issues among two or three of the conventions;

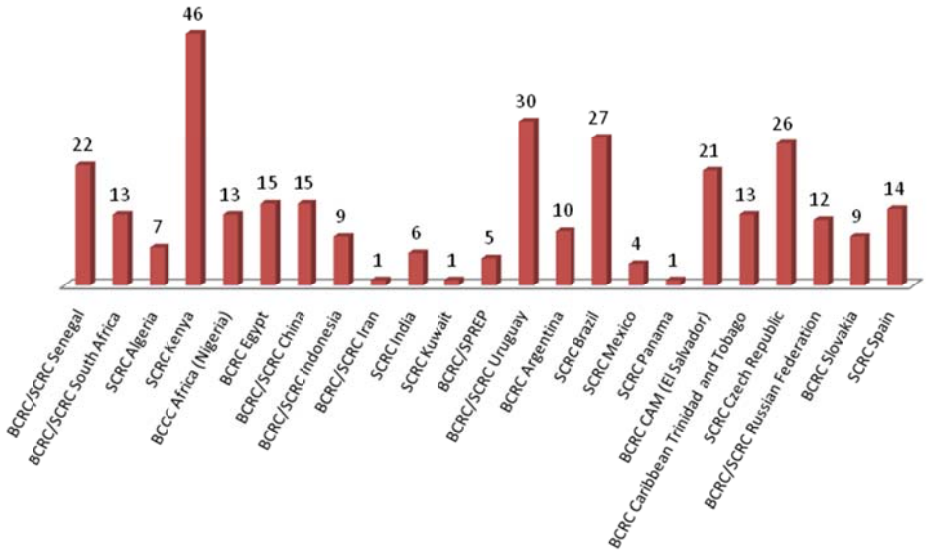
(b) 42 sub-regional and regional capacity-building and training workshops, including 5 on Stockholm Convention issues and 9 on cross-cutting issues among the conventions;

(c) Online training sessions for 10 face-to-face workshops organized by partners including WHO, the interim secretariat of the Minamata Convention and the Strategic Approach to International Chemicals Management secretariat.

580. A total of 1,443 persons were trained through face-to-face training activities on topics related to the three conventions; online training was provided to 1,721 participants; 1,392 partner agencies and stakeholders were approached by means of the technical assistance newsletter; and 771,726 visits to the conventions' web pages were recorded (UNEP/POPS/COP.7/13).

581. According to the regional centres' activity reports for 2013-2014[53], the regional centres have delivered activities to 142 parties during that period (UNEP/POPS/COP.7/11). The graph below shows the number of beneficiaries per centre.

Figure E.1.1. *Number of beneficiary parties of activities delivered by the regional centres over the period 2013-2014*



Process indicator 8: Number of parties providing technology transfer

582. In 2011, 6 parties reported having provided technical assistance to another party in accordance with Article 12 (UNEP/POPS/COP.5/29).

583. In 2014, out of the 12 Parties that reported having provided technical assistance to another party in accordance with Article 12, three specifically mentioned, as part of the assistance provided, the transfer of environmentally sound technologies for the destruction of POPs wastes; other areas included the review of available infrastructure, capacity and institutions and the potential to strengthen them, as well as the identification and promotion of best available techniques(UNEP/POPS/COP.7/INF/36).

[53] http://chm.pops.int/Partners/RegionalCentres/ActivitiesReports/tabid/4112/Default.aspx

584. According to the survey on technical assistance available carried out in 2014 among developed country parties, 27% of the 11 respondents were willing to provide technology transfer (UNEP/POPS/COP.7/INF/15).

Process indicator 9: Number of parties requesting technology transfer

585. According to the survey on technical assistance and technology transfer needs undertaken in 2011-2012 and in 2014,amajority of the respondents required technology transfer in order to fulfil the obligations under the Stockholm Convention (UNEP/POPS/COP.6/INF17, UNEP/POPS/COP.7/INF/15), as follows:

(a) For POPs pesticides, 76% of respondents need to strengthen national infrastructure;

(b) For unintentional POPs, 90% of respondents need to strengthen national infrastructure, in particular:

(i) Technologies to support the implementation of BAT/BEP;

(ii) Technologies and materials to improve the sampling and analysis of unintentionally produced POPs;

(iii) Environmentally sound practices;

(iv) Technologies for monitoring, filtering and disposal;

(c) For POPs stockpiles, 84% of respondents indicate technology transfer needs for:

(i) Technologies for environmentally sound practices and management;

(ii) Techniques and methods allowing for scientific analysis;

(iii) Equipment for land-field for safe storage, packaging, monitoring, mobile laboratory;

(d) For POPs wastes and articles in use, 90% of respondents indicate technology transfer needs for:

(i) Technologies to support the implementation of BAT/BEP;

(ii) Environmentally sound management, disposal, recycling;

(iii) Infrastructures for the treatment and elimination of POPs at the national level;

(iv) Non-combustion disposal technologies for POPs waste;

(v) PCB decontamination facilities;

(e) Regarding contaminated sites, 90% of respondents indicate technology transfer needs for:

(i) Scientific analysis of soil and water close to sensible sites;

(ii) ESM technologies including disposal and recycling;

(iii) Risk assessment and management;

(iv) Equipment for identification, sampling, monitoring, classification and decontamination.

586. 71% of respondents indicate they require technology transfer to facilitate or undertake exchange of information on POPs in accordance with Article 9, in particular for: procurement of equipment; training on equipment use and technology; alternatives and alternative technologies; to develop a POPs information dissemination network; to develop a system to compile and manage the information on POPs (UNEP/POPS/COP.6/INF17).

587. 68% require the transfer of technology to promote and facilitate public information, awareness and education on POPs, including sharing of case studies and success stories; creation of a dedicated website or platform relevant to POPs issues; dissemination of information through different media and academic courses.

588. 92% indicated the need of technology to encourage and undertake appropriate research and monitoring on POPs and, where relevant, on their alternatives and on candidate POPs.

Process indicator 10: Number of parties receiving technology transfer

589. In 2011, 4 parties reported that they had had received technology transfer (UNEP/POPS/COP.5/29).

Process indicator 11: Number of initiatives undertaken by regional centres

590. Based on information from the regional centres' activity reports for 2013-2014[54], the table below lists the total number of activities undertaken by each centre for that period.

Table E.1.2. *Total number of activities undertaken by regional centre during 2013-2014*

		Total number of activities by year					
	Regional centre	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014
Africa	Algeria SCRC		14		9		1
	Kenya SCRC		3		5		25
	Senegal BCRC/SCRC	14	4		15		16
	South Africa BCRC/SCRC			18	6		21
Asia Pacific	China BCRC/SCRC	8	16		14		51
	India SCRC			6	2		4
	Indonesia BCRC/SCRC				2		4
	Iran BCRC/SCRC		1			10	3
	Kuwait SCRC	1	10		15		2
Central and Eastern Europe	Czech Republic SCRC	9	78		119		34
	Russian Federation BCRC/SCRC		14		3		3
Latin America and Caribbean	Brazil SCRC	6	39			12	26
	Mexico SCRC	17	7		20		8
	Panama SCRC	7	5		13		5
	Uruguay BCRC/SCRC	8	23		16		21
WEOG	Spain SCRC	12	20		18		14

591. Between January 2013 and December 2014, 35 training and capacity-building activities including workshops were implemented by the regional centres in collaboration with the Secretariat (UNEP/POPS/COP.7/INF/14).

[54] http://chm.pops.int/Partners/RegionalCentres/ActivitiesReports/tabid/4112/Default.aspx

592. At its seventh meeting, the Conference of the Parties evaluated, in accordance with its approved criteria, the performance and sustainability of the Stockholm regional and subregional centres and called for sustained efforts to enhance their performance and actions in supporting developing country Parties. According to the evaluation report on the performance and sustainability of the regional centres, one third of the centres were rated as excellent, a majority were satisfactory and a few needed further support to reach expected standards (UNEP/POPS/COP.7/INF/13). Although there is a large disparity between centres in their level of activity, most are working to fulfil their mandate.

593. The Conference endorsed all 16 Stockholm regional and subregional centres for another four years. The report on the next evaluation of the centres will be considered at the ninth meeting of the Conference of the Parties in 2019. Some centres still face challenges and will be enhanced if Parties, as well as other regional centres in a position to do so, cooperate and support those regional centres through the exchange of best practices, the provision of technical assistance and the promotion of technology transfer. Sustainable financial and technical resources are necessary for the centres to succeed in their work under the Convention.

(a) Technical assistance (Article 12): Main findings

594. The number of Parties having reported providing technical assistance pursuant to Article 12 of the Convention stayed relatively constant over the period 2008-2015; a certain decrease was observed between 2011 and 2014. On the other hand, the information derived from the implementation of GEF projects does not point to a decrease in technical assistance.

595. From the number of GEF projects, including a technical assistance or technology transfer component, and the data derived from the technical assistance activities of the Secretariat, it is apparent that technical assistance and technology transfer continues to be a key priority of developing country Parties and Parties with economies in transition.

596. Sixteen regional centres have been established and have been active to varying degrees in the provision of technical assistance and technology transfer within their regions. The 2015 evaluation of their performance and sustainability points to only a few centres needing further support to reach expected standards.

(e) Technical assistance (Article 12): Conclusions and recommendations

597. The information provided by Parties on technical assistance and technology transfer is limited; it does not match the numbers of trained persons listed in Secretariat reports on technical assistance activities, nor through surveys relating to technical assistance requests, nor when GEF projects are included in the assessment. The number of activities linked to technology transfer and technical assistance, in particular through regional centres, is likely even higher.

***Recommendation**: There is a need to strengthen the gathering of information through national reports under Article 15, on the provision of technical assistance and technology transfer through the Secretariat's technical assistance programme, GEF projects and other sources. This could also include information on how these activities impacted Parties' capacities to fulfil their obligations under the Stockholm Convention.*

598. Capacity building and technical assistance in developing country Parties and Parties with economies in transition will continue to be a priority, in particular for the development and/or strengthening and enforcing of national legislation and/or regulations implementing the Convention, to introduce safer and affordable alternatives to the POPs still on the market, to identify and manage POPs stockpiles and wastes, and, as appropriate, contaminated sites. Regional delivery, including through Stockholm Convention regional and subregional centres, are key to further the efforts in the above fields.

599. At its seventh meeting, the Conference of the Parties evaluated, in accordance with its approved criteria, the performance and sustainability of the Stockholm regional and subregional centres and called for sustained efforts to enhance their performance and actions in supporting developing country Parties. The Conference endorsed all 16 Stockholm regional and subregional centres for another four years. The report on the next evaluation of the centres will be considered at the ninth meeting of the Conference of the Parties in 2019. Some centres still face challenges and will be enhanced if Parties, as well as other regional centres in a position to do so, cooperate and support those regional centres through the exchange of best practices, the provision of technical assistance and the promotion of technology transfer. Sustainable financial and technical resources are necessary for the centres to succeed in their work under the Convention.

***Recommendation**: There is a need to strengthen technical assistance and technology transfer activities, including through regional delivery and effective and efficient cooperation with the regional centres. The aim should be an efficient and effective network of centres through greater institutional coordination and the promotion of the exchange of information, lessons learned and cooperation among them on areas of expertise in which they provide assistance, through regular communication, including meetings of the centres and increased use of other means of communication.*

Technical assistance activities, highlighted throughout this report, include the following priority areas:

(a) Identifying, collecting and sharing information on POPs, in particular those still in use and those newly listed, including through existing programmes and processes;

(b) Strengthening data collection mechanisms and methods for establishing and maintaining reliable inventories (also contributing to reporting);

(c) Developing and strengthening legislation and/or regulations to implement the Convention to manage the chemicals throughout their lifecycles;

(d) Strengthening technical assistance to implement best available techniques and best environment practices;

(e) Introducing guidance and methodologies for phasing in safer and affordable alternatives;

(f) Identifying and managing stockpiles and wastes and, as appropriate, contaminated sites.

(f) Financial Resources (Articles 13 and 14)

Review of the financial mechanism

600. Relevant information for effectiveness evaluation is contained, among others, in the reports of reviews of the financial mechanism. In addition, the Special Programme has been adopted at the first session of the United Nations Environment Assembly in 2014. The Special Programme intends to support country-driven institutional strengthening at the national level, in the context of an integrated approach to address the financing of sound management of chemicals and wastes, taking into account national development strategies, plans and priorities of each country; and increase sustainable public institutional capacity for the sound management of chemicals and wastes throughout their life cycle.

601. For this evaluation, relevant information from the third review has been taken into account (UNEP/POPS/COP.6/23, UNEP/POPS/COP.6/INF/25). The review reports are by and large based on qualitative indicators, which is a stark contrast to the mainly quantitative ones used for the effectiveness evaluation. Also, not all indicators used in the review are relevant for the present evaluation, which is why only some findings are presented below.

602. Taking into account the caveats set out in the preceding paragraph, the following outcomes of the third review (2013) regarding funding adequacy, predictability, and sustainability and country ownership and stakeholder involvement are relevant to the effectiveness evaluation (UNEP/POPS/COP.6/23):

(a) The GEF has been responsive to growing needs for funding for POPs by increasing allocated resources in each replenishment period, although there is still a gap between funding provided for POPs activities through the GEF and the funding identified as needed to fulfil Convention obligations. The review recommended that the COP should continue to analyze the amount of funding that is necessary to assist developing countries and countries with economies in transition to fulfil their commitments under the Convention, and should formally convey this funding request to the GEF Council to be included in the negotiations for the 6th replenishment, and replenishments thereafter. The COP should continue to identify ways to improve the needs assessment process to ensure that the results are a reasonably accurate representation of actual needs;

(b) While the GEF has allocated a predictable level of total GEF resources to the POPs focal area across all replenishment periods, during this review period, there was demand for GEF funding near the end of GEF-4 that could not be met. The review recommended that the GEF should report more transparently to the COP the availability of funds for the POPs focal area;

(c) In addition to funds provided through the GEF, funding is also provided by parties for activities implemented outside the GEF partnership. The adequacy of this additional funding cannot be readily assessed, given that information on the quantity of funding is not systematically reported or tracked. As a recommendation, the COP may wish to explore more systematized options for tracking funds allocated to POPs activities outside of the GEF framework;

(d) Country priorities are generally perceived as adequately reflected in projects funded by the GEF, and country governments are generally felt to be adequately involved in the project development and design process. The review recommended that recipient countries may wish to utilize the direct access pathway as a means of increasing their ownership of enabling activities, such as NIP updates;

(e) It found that the GEF has been fully responsive in terms of providing information on project approvals and resources committed, including co-financing data. It stated that almost USD 1.5 billion have been committed to POPs projects through co-financing sources and that co-financing has increased from USD 1.97 per dollar of GEF grant in the second review period, up to USD 4.02 per dollar of GEF grant in this review period. The review concluded that this trend reflected the shift in the POPs portfolio from planning (i.e., NIPs) to implementation.

603. To facilitate the evaluation of the set of indicators on financial resources, the funding needs assessed for the periods 2006–2010[55], 2010–2014[56] and 2015-2019[57] were taken into consideration. The total funding needs of parties which are developing countries or countries with economies in transition from 2006 to 2019 and beyond amount to a total of USD 20,284.34 million(UNEP/POPS/COP.6/INF/20).

Process indicator 1:Total monetary value of financial resources provided

604. In 2014, 13 parties reported to have provided financial resources to developing countries and countries with economies in transition through bilateral programmes. The total reported amount of financial resources provided to countries, excluding contributions to the GEF, was USD 107,500,000, from 2004 to 2014 (UNEP/POPS/COP.7/INF/36).

605. In the same reports, 6 parties reported to have provided financial resources to developing countries and countries with economies in transition through other bilateral, regional and multilateral sources or channels, excluding the GEF, for the implementation of the Stockholm Convention and other chemicals and wastes activities, for a total amount of USD 26,130,000. Multilateral programmes included the SAICM Quick Start Programme and SPREP, the South Pacific Regional Environmental Programme.

606. In 2000, the Canada POPs Fund was established to assist developing countries and countries with economies in transition in dealing with POPs and in taking initial actions to prepare for implementing the Convention. The 20-million USD fund, administered by the World Bank, supported a variety of projects such as developing POPs inventories, establishing regulatory mechanisms and institutional frameworks needed to control POPs releases, and finding alternative chemicals or strategies. In 2006 Canada's POPs Fund was extended for another two years and shifted focus to support the implementation of the Convention. It supported projects, related, among others, to the development and implementation of NIPS, capacity and awareness, BAT/BEP and reducing inventories of UPOPs.

607. From 2004 to 2015[58], contributions to the general trust fund (SCL) amounted to USD 40,880,843. In the same period, contributions to the voluntary special trust fund of the Convention (SVL) amounted to USD 22,332,052.

608. From 2002 to 2018, programming targets for the third (2002- 2006), fourth (2006-2010), fifth (2010-2014) and sixth (2014-2018) replenishment of the Global Environment Facility Trust Fund amounted to USD 1,300,000,000.

Process indicator 2: Total monetary value of financial resources received

609. From 2002 to 2015[59], recipient countries of the Global Environment Facility have received a total of USD 857,844,838 in GEF resources committed to POPs projects.

610. No additional data on the monetary value of financial resources is available through other information sources such as Article 15 reports.

[55] For the period 2006-2010 see (UNEP/POPS/COP.3/19).

[56] For the period 2010-2014 see (UNEP/POPS/COP.4/27).

[57] For the period 2015-2019 see (UNEP/POPS/COP.6/INF/20).

[58] As at 31 March 2015.

[59] As at 7 December 2015.

Process indicator 3: Number of parties providing financial resources

611. From 2004 to 2015[60], a total 179 parties[61]have provided assessed contributions to the general trust fund (SCL) of the Convention. 22 Parties[62] and 6 entities[63] contributed to the voluntary special trust fund of the Convention (SVL).

612. From 2004 to 2015[64], a total of 35 Parties[65] and/or countries have contributed to the third (2002- 2006), fourth (2006-2010), fifth (2010-2014) and sixth (2014-2018) replenishment of the Global Environment Facility Trust Fund (GEF database).

Process indicator 4: Number of parties requesting financial resources

613. From 2002 to 2015[66], a total of 149 recipient countries[67] of the Global Environment Facility have requested financial resources from the Global Environment Facility Trust Fund (GEF database).

Process indicator 5: Number of parties receiving financial resources

614. From 2002 to 2015[68], all 149 recipient countries that have requested financial resources from the Global Environment Facility have received financial resources from its Trust Fund (GEF database).

Process indicator 6: Total monetary value of technology transfer provided

615. Data derived from the GEF project database suggests that a number of projects have transferred technologies. This involves, for example, projects that seek to address unintentionally produced POPs emissions in priority industrial, health care, and other sectors; reduce or eliminate PCB stockpiles; and demonstration project to irreversibly destroy the POPs content of hazardous wastes through non-thermal treatment measures. The total monetary value of the technology transfer provided at this point in time is not available.

[60] As at 31 March 2015.

[61] For the list of Parties to the Stockholm Convention see at: http://chm.pops.int/Countries/StatusofRatifications/PartiesandSignatoires/tabid/4500/Default.aspx

[62] Australia, Austria, Belgium, Canada, Czech Republic, Denmark, European Union, Finland, France, Germany, Iceland, Japan, Madagascar, Mexico, Moldova, Netherlands, New Zealand, Norway, Spain, Sweden, Switzerland, United States of America.

[63] Biovision Foundation, CropLife Latin America, GIZ, LitoS.A, Masaryk University, Sweden (KemI).

[64] As at 7 December 2015.

[65] Australia, Austria, Belgium, Brazil, Canada, China, Cote d'Ivoire, Czech Republic, Denmark, Finland, France, Germany, Greece, India, Ireland, Italy, Japan, Republic, of, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Nigeria, Norway, Pakistan, Portugal, Russian Federation, Slovenia, South Africa, Spain, Sweden, Switzerland, Turkey, United, Kingdom, United States.

[66] As at 7 December 2015.

[67] Albania, Algeria, Angola, Antigua And Barbuda, Argentina, Armenia, Azerbaijan, Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belize, Benin, Bolivia, Bosnia-Herzegovina, Botswana, Brazil, Brunei, Bulgaria, Burkina Faso, Burundi, Cabo Verde, Cambodia, Cameroon, Central African Republic, Chad, Chile, China, Colombia, Comoros, Congo, Congo DR, Cook Islands, Costa Rica, Cote d'Ivoire, Croatia, Cuba, Czech Republic, Djibouti, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, Eritrea, Ethiopia, Fiji, Gabon, Gambia, Georgia, Ghana, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hungary, India, Indonesia, Iran, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Korea DPR, Kyrgyzstan, Lao PDR, Latvia, Lebanon, Lesotho, Liberia, Lithuania, Libya, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Marshall Islands, Mauritania, Mauritius, Mexico, Micronesia, Moldova, Mongolia, Montenegro, Morocco, Mozambique, Myanmar, Namibia, Nauru, Nepal, Nicaragua, Niger, Nigeria, Niue, Oman, Pakistan, Palau, Palestinian Authority, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Romania, Russian Federation, Rwanda, Samoa, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Seychelles, Sierra Leone, Slovak Republic, Solomon Islands, South Africa, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and Grenadines, Sudan, Suriname, Swaziland, Syria, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Tuvalu, Uganda, Ukraine, United Arab Emirates, Uruguay, Vanuatu, Venezuela, Vietnam, Yemen, Zambia.

[68] As at 7 December 2015.

616. Examples of projects having transferred technologies include the following GEF projects (GEF database):

Table E.1.3. *Examples of GEF projects having transferred technologies*

PMIS	Country	Project	Technology
2875	Macedonia	Demonstration project for Phasing-out and Elimination of PCB and PCB-Containing Equipment	A new interim storage facility has been built and suitable non-combustion and decontamination technology for PCB-containing oils and equipment has been installed.
3032	Vietnam	Environmental Remediation of Dioxin Contaminated Hotspots in Vietnam	The three technologies introduced: i) several bio-chemical treatment strategies proposed by HPC-Envirotec; ii) the mecano-chemical dehalogenation (MCDTM) ball milling technology proposed by Environmental Decontamination Limited (EDL); and iii) an enhanced batch thermal desorption technology named Matrix Constituent Separation (MCSTM) proposed by Thermodyne Technologies Inc. (TTI).
3572	Regional Asia	Regional plan for the introduction of BAT/BEP Strategies to Industrial Clusters of Annex C of Article 5 Sectors in ESEA Region	Retrofitting and upgrading of industrial boilers in China, Indonesia, Cambodia, Lao PDR, Mongolia, Philippines and Thailand.

Process indicator 7: Total monetary value of technology transfer received

617. As outlined in the preceding paragraph, information on the monetary value of technology transfer received is not available at this point in time.

Process indicator 12:Total monetary value of technical assistance provided by regional centres

618. Next to the number of activities undertaken by the regional centres, funding used is another way to assess their efforts in supporting the implementation of the convention. Based on the centres' activity reports for 2013-2014, the table below shows how much each centre spent for that period of time:

Table E.1.4. *Funding used by the regional centres during 2013-2014*

Regional centre	***BCRC/SCRC Senegal***	***BCRC/SCRC South Africa***	***SCRC Algeria***	***SCRC Kenya***	***BCRC/SCRC China***	***BCRC/SCRC Indonesia***	***BCRC/SCRC Iran***	***SCRC India***
Total (US$)	2,175,030	2,617,000	6,000	no info	2,391,977	348,308	62,000	98,108
Regional centre	***SCRC Kuwait***	**BCRC/SPREP**	***BCRC/SCRC Uruguay***	***SCRC Brazil***	***SCRC Mexico***	***SCRC Panama***	***SCRC Czech Republic***	***SCRC Spain***
Total (US$)	75,000	2,277,000	2,534,527	1,325,209	964,066	44,000	1,898,160	1,251,094

619. Overall, USD 18,067,479 have been spent by regional centres in technical assistance and capacity-building activities in 2013-2014.

Process indicator 13: Number of parties that mobilized national resources for implementing the Convention

620. In 2008, 38 parties indicated that, pursuant to paragraph 1 of Article 13 of the Convention, they had taken measures to provide, within their capabilities, financial support and incentives for national activities intended to achieve the objectives of the Convention in accordance with their national plans, priorities and programmes. 89% of these also indicated that the measures taken were mentioned in their implementation plans, priorities and programmes. 6 parties indicated they had taken no measures to implement paragraph 1 of Article 13 (UNEP/POPS/COP.4/29).

621. As regards the implementation of GEF projects[69], from 2002 to 2015, all 149 project countries have mobilized national resources for implementing the Convention as part of the co-funding requirements of GEF full- and medium-sized projects (GEF database).

Process indicator 14: Total monetary value of national financial support and incentives for implementing the Convention

622. In 2014, 38 parties indicated that, pursuant paragraph 1 of Article 13 of the Convention, they had taken measures to provide, within their capabilities, financial support and incentives for national activities intended to achieve the objectives of the Convention in accordance with their national plans, priorities and programmes, during the period 2004-2014. The total amount of financial resources mobilized between 2004 and 2014 was USD 88,550,000. Among these, 24 Parties provided incentives at national level to: 1) develop legal and regulatory frameworks (71%); 2) implement pollution prevention measures (17%) and implemented other incentives (12%) (UNEP/POPS/COP.7/INF/36).

623. From 2002 to 2015[70], national governments have mobilized in the context of the implementation of GEF projects a total amount of USD 2,019,747,755.60 in national resources or activities related to implementing the Convention.

(g) Financial resources (Articles 13 and 14): Main findings

624. From 2002 to 2018, programming targets for the third, fourth, fifth and sixth replenishment of the GEF Trust Fund amounted to USD 1,300,000,000. As at 6 October 2016, recipient countries of the GEF have received a total of USD 857,844,838 in GEF resources committed to POPs projects. All 149 recipient countries that have requested financial resources from the GEF within this period, have received financial resources from its Trust Fund.

625. The third review of the financial mechanism conducted in 2013, points to responsiveness to growing needs for funding for POPs by increased allocated resources, although there is still a gap between funding provided for POPs activities through the GEF and the funding identified by Parties as needed to fulfil Convention obligations. The above review encouraged the Conference of the Parties to improve its process of assessing the funding needed by developing country Parties and Parties with economies in transition to implement the Convention. Country priorities were generally perceived as adequately reflected in projects funded by the GEF, and Parties were felt to be adequately involved in the project development and design process. The above review found that the GEF has been fully responsive in terms of providing information on project approvals and resources committed, including co-financing data. It stated that almost USD 1.5 billion have been committed to POPs projects through co-financing sources and that co-financing has increased from USD 1.97 per dollar of GEF grant in the second review period, up to USD 4.02 per dollar of GEF grant in this review period. The review concluded that this trend reflected the shift in the POPs portfolio from planning (i.e., NIPs) to implementation.

626. From 2000 to 2008, the USD 20-million Canada POPs Fund was established to assist developing country Parties and Parties with economies in transition in dealing with POPs and in taking initial actions to prepare for implementing the Convention.

627. From 2004 to 2015, contributions to the Stockholm Convention general trust fund (SCL) amounted to USD 40,880,843. In the same period, contributions to the Stockholm Convention voluntary special trust fund (SVL) amounted to USD 22,332,052. Contributions to SVL have seen an increase in the current and last biennium compared to the levels provided in 2006 and 2007. Projections for the biennium 2016/2017 suggest a decline in the voluntary funding, which is mainly due to the changing funding priorities within and outside of the chemicals and waste cluster.

(h) Financial resources (Articles 13 and 14): Conclusions and recommendations

628. For the effectiveness evaluation of Articles 13 and14,indicators may need to address what are the eligible needs, how much funding is available to meet the needs, and how funding is being disbursed. Evaluations conducted by other entities such as the evaluation of projects by the GEF or by the regional centres, the reviews of the financial mechanism and of the regional centres, and information regarding the integrated approach for financing of chemicals all help inform the effectiveness evaluation in a reliable and cost effective manner. With new chemicals being added to the Convention every two years and several implementation challenges for the POPs already listed, there is a need to increase funding to support implementation of new obligations under the Convention. A gap still appears to exist between funding provided through the GEF and the funding

[69] As at 7 December 2015.

[70] As at 7 December 2015.

needed by developing country Parties and Parties with economies in transition to enable them to meet the agreed full incremental costs of implementing measures which fulfil their obligations under the Convention.

***Recommendation**: The financial mechanism of the Convention, including the GEF in its capacity as principal entity entrusted, on an interim basis, with the operations of the mechanism, and other donors, should consider ways to provide additional sustainable financial resources to continue to support and enhance the implementation of the Convention by developing country Parties and Parties with economies in transition, over the long term.*

The entities entrusted with the financial mechanism should continue to consider in their programming of areas of work the following priority areas, as highlighted throughout this report:

(a) The development and deployment of products, methods and strategies as alternatives to POPs;

(b) The restriction of DDT production and/or use for disease vector control in accordance with WHO recommendations and guidelines on the use of DDT and when locally safe, effective and affordable alternatives are not available to the Party in question;

(c) The elimination of the use of PCB in equipment by 2025;

(d) The environmentally sound waste management of liquids containing PCB and equipment contaminated with PCB, having a PCB content above 0.005 per cent, in accordance with paragraph 1 of Article 6 and part II of Annex A to the Convention, as soon as possible and no later than 2028;

(e) The introduction and use of best available techniques and best environmental practices to minimize and ultimately eliminate releases of unintentionally produced POPs;

(f) The development and/or strengthening of national legislation and/or regulations to specifically implement obligations regarding POPs listed under the Convention;

(g) The review and update of NIPs, including, as appropriate, their initial development.

F. Measuring success

1. Implementation plans (Article 7)

629. The outcome to be addressed in assessing the effectiveness of Article 7 is whether the establishment of national implementation plans has resulted in full implementation of the Convention.

630. Three indicators have been identified for this outcome:

Process indicator 1 Process indicator 2	Number of parties that have completed their national implementation plans and transmitted them to the Conference of the Parties in a timely manner Number of parties that have reviewed and updated their amended plans and transmitted them to the Conference of the Parties
Source of information for the indicators	Secretariat.
Data limitations	These data are readily available, but provide only an indication that parties have met their obligations to develop their plans. The implementation of plans is reflected in the other elements reviewed in the effectiveness evaluation.
Baseline	Year in which the Convention and its amendments entered into force for each party.
Outcome indicator 3	Comparison in the percentage change in the quantity of persistent organic pollutants produced, used, imported and exported for use by parties that have completed national implementation plans and by parties that have not completed such plans
Source of information for the indicators	Sections I, III and VI of part B of the national reports
Data limitations	Not applicable
Baseline	Entry into force of the Convention or its amendments

(a) Available information

Relevant COP decisions and processes

SC-1/12: National implementation plans	Adopts the guidance for assisting countries in the preparation of national implementation plans and the guidance for the review and updating of national implementation plans Requests the financial mechanism of the Convention, to support the regular review and updating of national implementation plans
SC-2/7: National implementation plans	Adopts the process for the review and updating of national implementation plans Requests the Secretariat to prepare an analysis of the national implementation plans submitted, focusing on frequently identified national priority actions and best practices for controlling persistent organic pollutants
SC-3/8: National implementation plans	Requests the Secretariat to prepare a report on the priorities identified by Parties in implementing their national implementation plans Takes note of the draft guidance on social and economic assessment for the development and implementation of national implementation plans and encouraged parties to use it
SC-4/9: National implementation plans	Takes note of the draft additional guidance on the calculation of action plan costs, including incremental costs and action plans for specific persistent organic pollutants and encouraged parties to use it along with guidance on social and economic assessment and provide comments to improve both guidance documents. Requested Secretariat to prepare revised versions of both taking comments into account and identifying any additional guidance required to assist parties on the matter
SC-6/12: National implementation plans	Encourages parties to use the following guidance documents: • Guidance for developing a national implementation plan for the Stockholm Convention on Persistent Organic Pollutants (Draft, 2012, updated in 2012 to include the persistent organic pollutants listed in the annexes to the Convention in 2009 and 2011); • Draft guidance on socio-economic assessment for national implementation plan development and implementation under the Stockholm Convention (2007); • Guidance on calculation of action plan costs, including incremental costs and action plans for specific organic pollutants (Draft, 2012, updated in 2012 to include the persistent organic pollutants listed in the annexes to the Convention in 2009 and 2011); • Draft guidance for the inventory for perfluorooctane sulfonic acid and related chemicals listed under the Stockholm Convention (2012); • Draft guidance for the inventory of polybrominated diphenyl ethers listed under the Stockholm Convention (2012); • Draft guidance for the control of the import and export of persistent organic pollutants (2012); • Labelling of products or articles that contain POPs – initial considerations (Draft, 2012).

631. The preliminary assessment below is based on individual NIP submissions by parties to the Secretariat. The individual NIPs are available on the Convention's website at: http://chm.pops.int/Implementation/NIPs/NIPTransmission/tabid/253/Default.aspx

Guidance documents

632. The following guidance for NIP development and update has been made available to parties:

(a) Guidance for Developing a National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants;

(b) Draft guidance on calculation of action plan costs for specific POPs;

(c) Draft guidance on Socio-Economic Assessment for National Implementation Plan Development and Implementation under the Stockholm Convention;

(d) Draft guidance for the inventory of perfluorooctane sulfonic acid (PFOS) and related chemicals listed under the Stockholm Convention on POPs;

(e) Draft guidance on best available techniques and best environmental practices for the use of perfluorooctane sulfonic acid (PFOS) and related chemicals;

(f) Draft guidance for the inventory of polybrominated diphenyl ethers (PBDEs) listed under the Stockholm Convention on POPs;

(g) Draft guidance on best available techniques and best environmental practices for the recycling and waste disposal of articles containing polybrominated diphenyl ethers (PBDEs) listed under the Stockholm Convention on POPs;

(h) Draft guidance for the control of the import and export of POPs;

(i) Draft guidance on labelling of products or articles that contain POPs-initial considerations;

(j) Draft guidance on sampling, screening and analysis of persistent organic pollutants in products and articles (2013);

(k) Guidance for the inventory, identification and substitution of Hexabromocyclododecane (HBCD) (draft, April 2015).

633. Other available resources for NIP development and update are as follows:

(a) Step-by-step companion guide to the review and updating of the National Implementation Plans – 2011;

(b) Lessons learned and good practices in the development of national implementation plans for the Stockholm Convention on Persistent Organic Pollutants, 2006;

(c) New POPs – Publications;

(d) PCB – Guidance documents on PCB;

(e) BAT/BEP – Guidelines on best available techniques and provisional guidance on best environmental practices;

(f) Toolkit – Standardized Toolkit for Identification and Quantification of Releases of Dioxins and Furans and other Unintentional POPs;

(g) Waste and Stockpiles;

(h) Training tool.

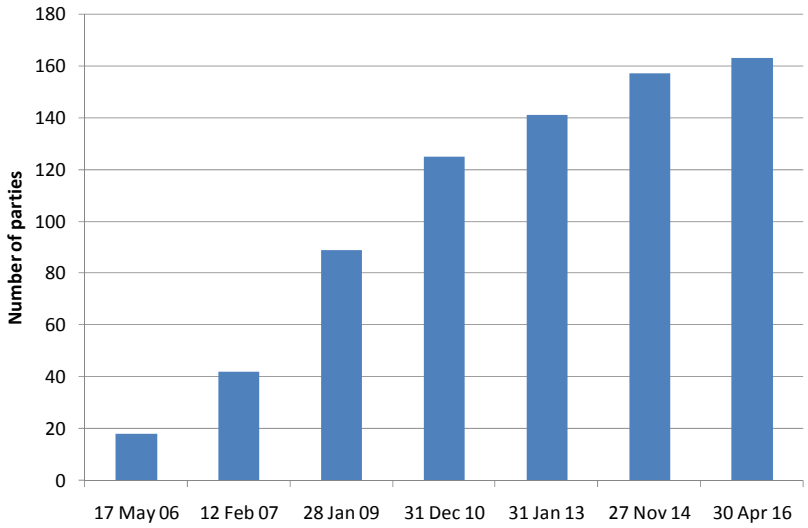
(b) Analysis of available information and application of the framework

Process Indicator 1: Number of parties that have completed their national implementation plans and transmitted them to the Conference of the Parties in a timely manner

634. As of 30 April 2016, 163 out of 180 parties have transmitted their National Implementation Plan (NIP) addressing at least the 12 initial POPs. Among these, 61 parties transmitted their NIP within their individual deadlines.

635. Figure F.1.1 shows the evolution over time in NIP transmission. The deadline for transmitting the implementation plan for the initial 12 POPs was 17 May 2006 (i.e. 2 years after entry into force of the Convention); it applied to 50 countries which were a party to the Convention at the time of its entry into force. Only 19 parties met this obligation.

Figure F.1.1. *Number of parties having transmitted their initial NIP*



636. Most NIPs provide the information required by the 'Guidance for developing a national implementation plan for the Stockholm Convention'. Based on the analysis of 88 NIPs transmitted to the Secretariat as of 31 December 2008, the issue of releases from unintentional production of POPs is more extensively covered and monitoring and research activities seem to be a high priority, indicating parties' needs for additional data to enable them to evaluate the risks posed by POPs (UNEP/POPS/COP.4/13).

637. It should be noted that NIPs are useful in terms of descriptions of the types of measures parties have taken to implement their obligations, however they do not address implementation aspects themselves.

Process Indicator 2: Number of parties that have reviewed and updated their plans and transmitted them to the Conference of the Parties in a timely manner

638. With additional chemicals being listed in the Annexes of the Convention at each Conference of the Parties as of COP-4, parties need to review and update their implementation plan accordingly. The deadlines for revising the NIPs to address COP-4, COP-5 and COP-6 amendments are in general standardized as 8/26/2012, 10/27/2014 and 11/26/2016, although for a minority of countries choosing to be bound by ratification, the deadlines are different.

639. As of 30 April 2016, 38 updated NIPs have been transmitted to address COP-4 amendments and 32 NIPs to address COP-5 amendments[71]. Most NIPs addressing COP-4 amendments also address COP-5 amendments (Table F.1.1).

Table F.1.1. *Status of submission of updated NIPs*

	Number of parties having the obligation to transmit their NIP	**Number of parties having transmitted their updated NIP**
Initial NIP	*180*	*163 (91%)*
Addressing COP-4 amendments	167	38 (23%)
Addressing COP-5 amendments	162	32 (20%)

640. Article 15 reports are a tool to report on progress in implementing the NIPs (see section II.F.2). While ensuring flexibility for countries to prepare their NIPs, electronic templates could be developed for certain parts of the implementation plans containing quantitative information, such as action plans and inventories, harmonized with the reporting under Article 15. This would allow better and more reliable analysis of the data, as well as the identification of trends and emerging needs. It would also enable Parties to expedite the review and/or update of their NIPs.

Outcome Indicator 3: Comparison in the percentage change in the quantity of persistent organic pollutants produced, used, imported and exported for use by parties that have completed national implementation plans and by parties that have not completed such plans

641. The information currently available from the national reports and NIPs is too limited to support the assessment of this indicator. As noted in section II.B.1 of this report, most of the production of legacy POPs had ceased before 2004. DDT is the only chemical with information on production for multiple years, from which continued production of DDT can be observed.

642. Based on the limited data available, a decrease in the quantities of POPs imported for use can be observed (see section II.B.1). Only the import of DDT and PFOS, its salts and PFOSF for use seems to be continuing. However, the information on the newly listed POPs is very limited as a majority of parties are still in the process of updating their NIPs. Given that the newly listed chemicals are still in use as opposed to the 12 initial POPs, many countries face challenges in identifying these newly listed POPs in products and articles.

(c) Main findings

643. As of April 2016, twelve years after the entry into force of the Convention, a majority of Parties (91%) have transmitted their NIPs addressing the 12 initial POPs. Based on regular monitoring of NIP transmission dates, the initial high rates with which the NIPs were transmitted have slowed down over time. For most Parties, the deadline to transmit the updated NIPs addressing amendments adopted at the fourth and fifth meetings of the Conference of the Parties has passed. Only 38 Parties have transmitted their updated NIPs addressing amendments adopted at the fourth meeting of the Conference of the Parties (i.e. 23% of Parties under the obligation to do so). Only 32 have transmitted their NIPs addressing amendments adopted at the fifth meeting of the Conference of the Parties (i.e. 20% Parties which are under the obligation to do so.

(d) Conclusions and recommendations

644. A large majority of Parties (91%) have transmitted their NIPs addressing the 12 initial POPs; for developing country Parties this was supported by funding provided by the GEF, co-financed by the Parties. The NIP development process has helped Parties to establish a network of national stakeholders, conduct an analysis of the baseline situation, including inventories, and identify national priorities with regards to the management of POPs, as well as consider measures to implement obligations pursuant to the Convention. In addition, the NIP is an important tool for raising awareness and providing information to the public, as well as for communication with donors to raise funds to implement strategies and action plans identified in the NIP.

***Recommendation**: The process for review and updating the NIPs in developing country Parties and Parties with economies in transition should continue to be funded with priority by the financial mechanism of the Convention, including the GEF in its capacity as principal entity entrusted, on an interim basis, with the operations of the mechanism.*

[71] Since the deadline for transmitting revised NIPs to address COP-6 amendments for opt-out Parties (26 November 2016) has not been yet reached, the progress towards meeting this deadline cannot be yet monitored.

645. Article 15 reports are a tool to report on progress in implementing the NIPs. While ensuring flexibility for countries to prepare their NIPs, electronic templates could be developed for certain parts of the implementation plans containing quantitative information, such as action plans and inventories, harmonized with the reporting under Article 15. This would allow better and more reliable analysis of the data, as well as the identification of trends and emerging needs. It would also enable Parties to expedite the review and/or update of their NIPs.

646. Parties seem to be having difficulties in revising and updating their NIPs to address the newly listed POPs. In particular, many countries seem to be facing challenges in identifying these newly listed POPs in products and articles.

***Recommendation**: All Parties should enhance their efforts to update NIPs. Developed country Parties could contribute by supporting activities such as face-to-face training and targeted NIP-development technical assistance. The development of an electronic template for quantitative information contained in the NIPs, harmonized with the reporting under Article 15, would support Parties in meeting their obligations to prepare, review and/or update their NIPs.*

2. Reporting (Article 15)

647. The outcome to be addressed in assessing the effectiveness of Article 15 is whether the Conference of the Parties has the necessary information to assess whether parties are implementing the Convention.

648. Reporting under Article 15 is also a major source of information for the effectiveness evaluation as it provides parties' data on their implementation of the Convention. If an insufficient number of parties report on time, or if insufficient information is included in the national reports, the effectiveness evaluation will be impeded. To facilitate and elicit accurate, complete and timely reporting is central to the evaluation and potential improvements should be identified. It should be noted that the current reporting rate by parties is only 40 per cent. Between the three national reports required to date, 110 parties in total have reported. 70 parties (39%) have never reported.

649. The parties should consider whether the data required by the national reports are sufficient to allow the Conference of the Parties to assess the Convention's ability to achieve its goals. The format of the national reports has been revised taking into consideration the framework for the effectiveness evaluation and considering the information requirements pursuant to the Convention to serve the needs of the Conference of the Parties for the purposes of Article 16; both the framework and the revised reporting format have been adopted in 2013, by decisions SC-6/22 and SC-6/21 respectively.

650. Three indicators have been identified for this outcome:

Process indicator 1 Process indicator 2 Process indicator 3	Proportion of parties reporting on time Proportion of parties indicating that information is not available for specific questions Changes in reporting levels between cycles.
Source of information for the indicators	Compilation of information from national reports prepared by the Secretariat.
Data limitations	None
Baseline	Entry into force of the Convention.

(a) Available information

Relevant COP decisions and processes

SC-1/22: Party reporting, timing and format	Decides that in accordance with Article 15 of the Convention, each Party shall submit its first report by 31 December 2006 for consideration by the Conference of the Parties at its third meeting Decides that each Party shall submit its subsequent report every four years thereafter, for consideration during the meeting of the Conference of the Parties to be held the following year; Adopts the revised format for reporting pursuant to Article 15
SC-2/18: Reporting	Requests the Secretariat to develop an electronic system for reporting pursuant to Article 15 of the Convention and adopts

	the format for reporting on polychlorinated biphenyls (PCB)
SC-4/32: Effectiveness evaluation	Invites Parties to submit their national reports in a timely manner Decides that, in accordance with Article 15, each Party shall submit its second report pursuant to Article 15 to the Secretariat by 31 October 2010 for consideration by the Conference of the Parties at its fifth meeting;
SC-6/21: National reporting	Adopts the revised reporting format and encourages parties to use the revised electronic online reporting system when submitting their third national reports pursuant to Article 15 of the Convention,
SC-7/23: Reporting pursuant to Article 15 of the Stockholm Convention	Takes note with concern of the low level of reporting and requests the Secretariat to further refine the draft strategy to enhance reporting under the Stockholm Convention Urges parties that have not yet done so to submit their third national reports pursuant to Article 15 of the Convention no later than the extended date of 31 August 2015 Decides that, in accordance with Article 15, each party should submit its fourth national report pursuant to Article 15 to the Secretariat by 31 August 2018 for consideration by the Conference of the Parties at its ninth meeting
SC-7/24: Effectiveness evaluation	Emphasizes the need for parties to intensify their efforts to ensure the timely and accurate completion of national reports under Article 15 of the Stockholm Convention

(b) Analysis of available information and application of the framework

651. Under the Stockholm Convention, the Secretariat developed a strategy to improve reporting that was adopted by COP-6; at COP-7 the Secretariat was requested to further refine the draft strategy to enhance reporting.

652. Under the Basel Convention, the Implementation and Compliance Committee has worked to improve reporting rates, both regarding individual cases of non-reporting, as well as providing tools, such as inventory guidance, to assist Parties in preparing their national reports. In conjunction with its 10th meeting it organized a dialogue with a number of compliance bodies under other MEAs[72]. Among the strategies used in different MEAs to improve reporting were the streamlining of reporting formats, use of sanctions such as trade suspension, (e.g. CITES), compliance committee or expert review of reports, facilitative approaches, and in some cases, financing (e.g. Montreal Protocol) (UNEP/CHW/CC.10/14).

653. The Special Programme was adopted at the first session of the United Nations Environment Assembly in June 2014, with the aim to support institutional strengthening at the national level for implementation of the Basel, Rotterdam and Stockholm Conventions, the Minamata Convention and the Strategic Approach to International Chemicals Management (SAICM). The Special Programme provides financing for institutional strengthening and this could be an avenue for some Parties to strengthen their reporting functions.

[72] Such as the Kyoto Protocol, the International Treaty on Plant Genetic Resources for Food and Agriculture, the Montreal Protocol, the London Protocol, the Espoo Convention, the Convention on the International Trade in Endangered Species of Wild Flora and Fauna.

Process indicator 1: Proportion of parties reporting complete and on time

654. Table F.2.1 provides information on the number of reports received in each of the reporting cycles as of 30 April 2016. A limited proportion of parties have submitted their national reports, and mostly after the initial deadline. At this time, there is no process to review the completeness of national reports, bearing in mind that such an activity could be entrusted to the compliance committee.

Table F.2.1. *Number of national reports received in each of the reporting cycles as of 30 April 2016*

	1st reporting cycle	2nd reporting cycle	3rd reporting cycle
1st deadline for the reporting cycles	**30 December 2006**	**31 October 2010**	**31 August 2014**
Number of parties that reported on time	4	54	29
Number of parties at that date	131	171	179
Percentage of parties that reported on time	**3%**	**32%**	**16%**
2nd deadline for the reporting cycles	**31 July 2007**	**31 July 2011**	**31 August 2015**
Number of parties that reported on time	29	26	35
Number of parties at that date	144	173	179
Percentage of parties that reported on time	**20%**	**15%**	**20%**
Total of parties reporting late after the second deadline	12	15	7
Total number of reports	**45**	**95**	**77**[73]
Overall percentage of reporting parties	**31%**	**55%**	**40%**

655. The total number of parties who submitted NIPs before the deadlines of the first, second and third national reporting cycles were: 59, 136, and 159, respectively. Those who submitted first, second and third national reports, had submitted NIPs at a high rate i.e. 64%, 92% and 95%, respectively. This indicates that majority of the Parties that submitted national reports have successfully completed their NIPs. Further, of the 38 parties that have not designated NFPs, 17 have never reported in any of the reporting cycles.

656. Overall, the NIP provides for setting up the necessary infrastructure to report and facilitates reporting through availability of data/information, an existing and activated coordinating mechanism and possible availability of NIP consultants.

657. The difference of reports submitted by parties between the 2nd and the 3rd cycle can be explained, among other challenges, by the difficulties in accessing and using the new electronic reporting system.

Process indicator 2: Proportion of parties indicating that information is not available for specific questions

658. The majority of parties have difficulties in providing complete reports, either by stating that information is not available to specific questions or not answering at all to certain questions. As highlighted in sections II.B.1, II.B.2 and II.B.3 above, in addition to the completion of the report, the quality of the data is as important (e.g. inconsistencies among import and export data, gross errors that lead to evident outliers, reported data clearly not matching units). The lack of a validation step of reported data seems a major shortcoming.

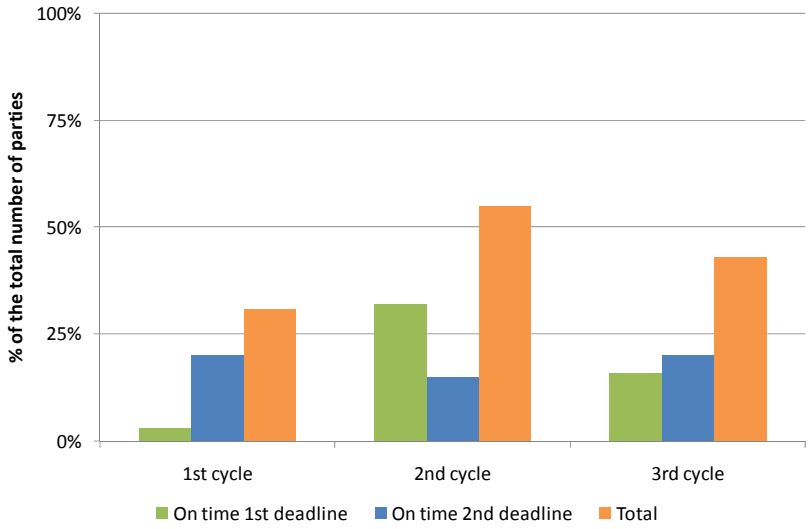
[73] As of 30 April 2016.

659. The regional balance among respondent parties and the representativeness of the reports for the regions are equally important for providing meaningful information to any assessment: reports from parties that are main producers/users of POPs or with a relatively larger footprint contribute to providing a better global picture and enabling a more precise assessment of implementation and compliance.

Process indicator 3: Changes in reporting levels between cycles

660. Figure F.2.1 shows the number of reports submitted in the three reporting cycles. A small proportion is submitted prior to the 1st deadlines, with reporting rates improving when a 2nd deadline is set. The overall reporting rate is nevertheless still low.

Figure F.2.1. *Number of national reports submitted in the three reporting cycles as of 30 April 2016*



661. As noted above, issues related to submission rates, as well as the completeness and timeliness of reports are common to many multilateral environment agreements. Technical and financial support to parties for the preparation of the report, availability of dedicated departments/units tasked to prepare and submit the reports, compliance mechanisms in place, are potential strategies to improve reporting rates (UNEP/CHW/CC.10/7, UNEP/POPS/COP.6/INF/28). The role of regional centres in providing assistance and dialoguing with countries to facilitate higher reporting rates is equally important.

(c) Main findings

662. Only a small proportion of the Parties provided their reports as required under Article 15. Between the three national reports required to date, 110 Parties (61%) have reported and 70 Parties (39%) have never reported. Overall, only 40% of the Parties reported in the third cycle as compared with 55% in the second and 31% in the first. The decrease in the number of reports submitted by Parties between the 2nd and the 3rd cycle can be explained, among other challenges, by the difficulties in accessing and using the new electronic reporting system.

663. The majority of the Parties that submitted national reports (64-95%) have successfully completed their NIPs.

664. The majority of Parties had difficulties in providing complete national reports and/or provided data that was clearly erroneous or inconsistent.

665. The format of the national reports has been revised taking into consideration the framework for the effectiveness evaluation and considering the information requirements pursuant to the Convention to serve the needs of the Conference of the Parties for the purposes of Article 16; both the framework and the revised reporting format have been adopted in 2013, by decisions SC-6/22 and SC-6/21, respectively.

(d) Conclusions and recommendations

666. Reporting under Article 15 is supposed to constitute a major source of information to assess whether Parties are implementing the Convention. This serves the dual purposes of compliance assessment under Article 17 and effectiveness evaluation under Article 16 of the Convention. The timeliness, completeness and quality of the national reports submitted by Parties are also essential to support the evaluation and compliance process. The present evaluation was hampered by the limited available data from national reports. This will continue to hamper future evaluations until the situation is substantially improved. Some of the information that would have been helpful in conducting this evaluation was not part of the current reporting format, such as information on the extent to which the Convention is being implemented through legal or administrative measures and which of these measures are enforced, and data on POPs use.

***Recommendation**: The Secretariat should develop and present its refined strategy to enhance reporting, taking into account the comments made in this report, to assist Parties in providing data and information that are useful for compliance assessment and the effectiveness evaluation and to enable them to establish a QA/QC process for reported data. Furthermore, there is an urgent need for validation of reported data with the reporting Party, as part of the final reporting process.*

667. There is a range of potential avenues to be explored for improving reporting rates and communication with Parties, e.g., identifying focal points, and their alternates and communicating upcoming deadlines and available resources to assist with reporting. Compliance mechanisms under other multilateral environmental agreements have proven to be successful in addressing reporting requirements, as were technical and financial support provided to Parties for the preparation of the report, and the availability of dedicated staff in countries tasked to prepare and submit the reports. The Special Programme can act as an additional funding mechanism for supporting chemicals management under the Conventions for institutional strengthening, including improving national reporting. The role of the regional centres in assisting and training countries in this area could be strengthened and regional coordination improved.

***Recommendation:** Once the Conference of the Parties has approved a compliance mechanism under Article 17, a priority focus of the compliance work programme should address the issue of improving reporting.*

3. Non-compliance (Article 17)

668. Relevant COP decisions and highlights of their content:

SC-1/14: Non-compliance	Decides to convene an open-ended ad hoc working group to consider procedures and institutional mechanisms on non-compliance under article 17, and Requests the Secretariat to prepare draft text of procedures and institutional mechanisms on non-compliance under Article 17, reflecting different options and alternatives
SC-2/14: Non-compliance	Decides to convene a second meeting of the open-ended ad hoc working group to consider procedures and institutional mechanisms on non-compliance under article 17, and Decides to consider further the matter required under Article 17 of the Convention with the aim of reaching agreement on procedures and institutional mechanisms on non-compliance at its third meeting,
SC-3/20:Non-compliance	Decides to negotiate further and to consider for adoption at its fourth meeting the procedures and institutional mechanisms on non-compliance required under article 17 of the Convention
SC-4/33: Procedures and mechanisms on compliance with the Stockholm Convention	Decides to consider further at its fifth meeting for adoption the procedures and institutional mechanisms on non-compliance required under Article 17 of the Convention; and Decides also that the draft text contained in the annex to the present decision, bearing in mind the proposal of the chair of the contact group as contained in the appendix to that annex, shall be the basis for its further work on the procedures and

	institutional mechanisms at its fifth meeting
SC-5/19: Procedures and mechanisms on compliance with the Stockholm Convention	Decides to consider further at its sixth meeting for adoption the procedures and institutional mechanisms on non-compliance required under Article 17 of the Convention; Decides also that the draft text set out in the annex to decision SC-4/33, bearing in mind the proposal of the chair of the contact group set out in the appendix to that annex, shall be the basis for its further work on the procedures and institutional mechanisms at its sixth meeting; Invites the Bureau of the Conference of the Parties to facilitate intersessional consultations among parties to promote a policy dialogue on major issues raised in the context of discussing adoption of a compliance mechanism, with a view to resolving the outstanding issues in a way to facilitate possible adoption of a compliance mechanism by the Conference of the Parties at its sixth meeting
SC-6/24: Procedures and mechanisms on compliance with the Stockholm Convention	Decides to consider further at its seventh meeting for adoption the procedures and mechanisms on non-compliance required under Article 17 of the Convention; Also decides that the draft text reflecting the outcome of the work of the contact group on compliance that met during the sixth meeting of the Conference of the Parties, set out in the annex to the present decision, shall be the basis for its further work on the procedures and mechanisms at its seventh meeting
SC-7/26: Procedures and mechanisms on compliance with the Stockholm Convention	Decides to consider further at its eighth meeting, for adoption, the procedures and mechanisms on compliance required under Article 17 of the Convention; Invites the Bureau of the Conference of the Parties to facilitate intersessional consultations among all parties to promote a policy dialogue on outstanding issues with a view to resolving them in a way that facilitates the possible adoption of the procedures and institutional mechanisms required under Article 17 by the Conference of the Parties at its eighth meeting; Decides that the draft texts contained in the annex to the present decision shall be the basis for its further work on the procedures and institutional mechanisms at its eighth meeting, bearing in mind that all issues remain outstanding; Also decides that further work on the procedures and mechanisms on compliance with the Convention shall be placed early on the agenda at its eighth meeting.

669. At the time of the writing of this report, the Conference of the Parties has not approved procedures and institutional mechanism for determining non-compliance with the provisions of the Convention and for the treatment of Parties found to be in non-compliance. Accordingly, there is no information currently available on non-compliance provided through these procedures which are to be adopted, as per Article 17, “as soon as practicable”.

(a) Main Findings

670. The lack of a compliance mechanism impacts the Convention’s operations in a number of ways. First, there is no accurate assessment of implementation levels although evidence based on the lack of reporting suggests that it is no higher than 40%. Second, this has left a key gap in implementation and compliance as well as in information for the effectiveness evaluation. Work in compliance committees in other multilateral environmental agreements has successfully contributed to increasing the reporting rates. In the case of the Stockholm Convention, lacking a committee of Parties, the Secretariat was instead tasked to develop and refine a strategy to improve reporting rates.

The absence of an established compliance mechanism has resulted in large gaps in information on whether Parties are meeting their obligations under the Convention. Such information is crucial in determining whether the Convention is effective in meeting its objective, as it would provide information for determining non-compliance with its provisions. If all Parties move towards full compliance, and there remain significant levels of listed POPs in the environment, then this could suggest that current Convention controls do not sufficiently address the problem of POPs.

671. Compliance mechanisms have been useful in improving the implementation and effectiveness of many other conventions, as evidenced for instance under the Basel Convention where the Implementation and Compliance Committee has addressed systemic implementation and compliance issues affecting many Parties, as well as providing advice and assistance to individual Parties facing implementation and compliance difficulties.

672. The Convention cannot be considered fully implemented at the international level without Article 17 procedures and mechanisms in place. In fact, this is the only aspect of the Convention that has not yet been implemented by the Conference of the Parties. In line with decision SC-7/26, the Conference of the Parties will consider further at its eighth meeting the adoption of the procedures and mechanisms on compliance required under Article 17, on the basis of the draft texts annexed to that decision.

(b) Conclusions and Recommendations

673. A compliance mechanism is urgently needed for the Stockholm Convention in order to support core transparency and accountability functions under the Convention as well as support the Conference of the Parties in assessing whether the Convention is effective in achieving the objective agreed to in Article 1. As in other multilateral environmental agreements, such a mechanism would provide the Conference of the Parties with a subsidiary body that could identify systemic issues of non-compliance affecting many Parties, and could assist individual Parties to address compliance challenges.

Recommendation: *A compliance mechanism should be established at the eighth meeting of the Conference of the Parties so that it can begin generating compliance information to serve the next effectiveness evaluation and provide the implementation and compliance services that will benefit Parties.*

4. Effectiveness evaluation (Article 16)

674. The outcome to be addressed in assessing the effectiveness of Article 16 is whether the effectiveness evaluation is providing useful analysis on the extent to which the Convention is achieving its objective of protecting human health and the environment from persistent organic pollutants; how well specific measures are contributing to achieving this objective; and identification of ways to improve the effectiveness of the Convention.

675. An assessment of the quality and quantity of the data available can help to identify areas for improvement that can strengthen future evaluations. The shortage of reporting data and the absence of compliance information will limit the ability of the effectiveness evaluation to provide useful analysis. Reviewing the uptake of recommendations made in a previous evaluation can help to assess whether the evaluation has proved useful.

676. One indicator has been identified for this outcome:

Outcome indicator 1	Evidence of implementation of recommendations from effectiveness evaluation through decisions and actions of the Conference of the Parties
Source of information for the indicator	All sources considered during the evaluation.
Data limitations	As no full effectiveness evaluation has yet been completed, this cannot be measured during the first evaluation. In addition, the effectiveness evaluation may not have all of the information and tools necessary to fulfil its mandate (such as information from the compliance mechanism and national reports).
Baseline	First evaluation.

(a) Available information

Relevant COP decisions and processes[74]

SC-1/13: Effectiveness evaluation	Agrees to initiate arrangements to provide itself with comparable monitoring data on which to base its evaluation of the effectiveness of the Convention analysing among other possibilities the proposed annex II to the note by the Secretariat on effectiveness evaluation
SC-2/13: Effectiveness evaluation	Decides to review at its fourth meeting the arrangements, including the global monitoring plan, used for providing the Conference of the Parties with the information for effectiveness evaluation as implemented for the first report and to decide on future arrangements, including the intervals of subsequent effectiveness evaluations
SC-4/32: Effectiveness evaluation	Acknowledges that the first evaluation has been completed Notes that procedures for the evaluation stage of effectiveness evaluation have not been defined; Concludes that the arrangements for gathering information derived from national reports under Article 15 need to be revised to improve comparability and completeness of data; Establishes an ad hoc working group with expertise in programme Invites Parties to submit their national reports in a timely manner using the revised format proposed by the ad hoc working group; Requests the ad hoc working group to report on its proposals to the Conference of the Parties at its fifth meeting for its consideration and possible decision on procedures and arrangements for future evaluations; Agrees that a six-year period is a suitable interval for effectiveness evaluations
SC-6/22: Effectiveness evaluation	Adopts the revised framework for effectiveness evaluation
SC-7/24: Effectiveness evaluation	Elects, in accordance with the terms of reference set out in the appendix to the framework for effectiveness evaluation members to serve on the effectiveness evaluation committee until the close of the eighth meeting of the Conference of the Parties Requests the effectiveness evaluation committee to perform its tasks according to the framework for effectiveness evaluation and to report to the Conference of the Parties at its eighth meeting Emphasizes the need for parties to intensify their efforts to ensure the timely and accurate completion of national reports under Article 15 of the Stockholm Convention

[74] Decisions relevant to the global monitoring plan under Article 16 are listed in section II.A.1 of this report.

(b) Analysis of available information and application of the framework

Outcome indicator 1: Evidence of implementation of recommendations from effectiveness evaluation through decisions and actions of the Conference of the Parties

677. The first effectiveness evaluation was completed in May 2009 at the fourth meeting of the Conference of the Parties. It was noted that the procedures for the evaluation stage of the effectiveness evaluation were not defined at that time and an ad hoc working group was established to write a report on possible procedures for this purpose. At its sixth meeting held in May 2013, the Conference of the Parties adopted the framework for the effectiveness evaluation of the Stockholm Convention pursuant to Article 16 (UNEP/POPS/COP.6/27/Add.1/Rev.1). At its seventh meeting held in May 2015, the Conference of the Parties elected in accordance with the terms of reference set out in the appendix to the framework for effectiveness evaluation, the members to serve on the effectiveness evaluation committee until the close of the eighth meeting of the Conference of the Parties. The first six-year evaluation cycle, using the adopted framework, takes place between 2010 and 2017.

678. The indicator can only be assessed after the end of the first evaluation cycle and the development of the first set of recommendations from effectiveness evaluation. The analysis below thus focuses on assessing whether all mechanisms are in place for the first evaluation cycle taking place between 2010 and 2017 to enable the development of conclusions and recommendations.

679. At its third meeting in May 2007, the Conference of the Parties adopted the global monitoring plan for persistent organic pollutants (UNEP/POPS/COP.3/22/Rev.1, annex II) and its implementation plan (UNEP/POPS/COP.3/23/Rev.1) and established a regional framework for implementation. This set the basis for the implementation of the first and second phases of the GMP. The first monitoring reports (UNEP/POPS/COP.4/33, UNEP/POPS/COP.4/INF/19) provided information on the baseline concentrations of the 12 legacy POPs. The second monitoring reports (UNEP/POPS/COP.7/INF/38) provide first indications as to the changes in concentrations of the chemicals initially listed in the Convention (commonly referred to as the legacy POPs), as well as baseline information on the newly listed POPs.

680. In addition to information on the presence of POPs in the environment and in humans, Article 16 is integrating various other types of available information and data, including modelling data, emission inventories, data on production and use, import and export, etc. A major source of information is reporting under Article 15. As discussed in the previous section (section II.F.2), only limited information is currently available under Article 15 for the purpose of effectiveness evaluation.

681. Procedures and institutional mechanisms for determining non-compliance are not yet in place to provide compliance information relevant to the effectiveness evaluation (see section II.F.3).

682. The establishment of the global monitoring programme has been a success and generated useful data about POPs in the global environment and in humans. It has also generated positive outcomes in several other areas of implementation of the Convention, through enhanced knowledge, and increased scientific competence and awareness that indicate that the science based integrated approach of the Convention is working well. For example, the atmospheric measurements provided by the global monitoring plan show that the Toolkit under Article 5 is working well and it helps understand releases of POPs through modelling.Because of the lack of information from national reports and the lack of compliance procedures and mechanisms, however, it is difficult to fully evaluate the progress being made under the Convention in achieving its objective.

(c) Main findings

683. A number of processes are in place to support the first cycle of the effectiveness evaluation, while others are still needed, or need improvement. The global monitoring plan is an example of successful implementation of the provisions of Article 16, providing useful data on the presence of POPs in the environment and in humans. While national reports under Article 15 have been collected since 2006, the reported information is very limited for effectiveness evaluation. Procedures and institutional mechanism for determining non-compliance are not yet in place and compliance information is therefore not available for this evaluation.

684. Besides POPs monitoring data, the global monitoring programme has also generated positive outcomes in several other areas of implementation of the Convention through enhanced knowledge and increased scientific competence and awareness. This indicates that the science based integrated approach of the Convention is working well. Because of the lack of information from national reports and the lack of compliance procedures and mechanisms; however, it is difficult to fully evaluate the progress being made under the Convention in achieving its objective.

(d) Conclusions and recommendations

685. The global monitoring plan provides the necessary environmental monitoring information to fully support the evaluation of the effectiveness of the Convention.

Recommendation: *The global monitoring plan should be sustained in the long term to enable it to continue to provide valuable data for effectiveness evaluation. See also recommendation in paragraph 31 above (Section II.A.1. Protecting human health and the environment - Article 1).*

686. Reporting under Article 15 is a major source of information for effectiveness evaluation under Article 16; however, current reporting under Article 15 is insufficient. The present evaluation was severely restricted by the limited available data from national reports.

Recommendation: *Effective strategies should be put in place by the Conference of the Parties to improve reporting rates and provide critical information and data for the effectiveness evaluation. See also recommendation in paragraph 155 above (Section II.F.2. Reporting - Article 15).*

687. The lack of a compliance mechanism impacts the Convention's operations in a number of ways, most notably by leaving a key gap in information for the effectiveness evaluation.

Recommendation: *Procedures and institutional mechanisms for compliance should be established urgently in order to generate compliance information to serve the next effectiveness evaluation. See also recommendation in paragraph 161 above (Section II.F.3. Non-compliance - Article 17).*

688. The adopted procedure for effectiveness evaluation provided a good basis for conducting the first evaluation cycle. Based on the experience from the present evaluation, the framework can be improved and streamlined for future evaluations. Recommendations for amendments to the framework are provided in a separate report.[75]

Recommendation: *The framework for effectiveness evaluation should be amended in accordance with the recommendations of the effectiveness evaluation committee*[76]*.*

G. General and cross-cutting issues

689. The evaluation also considers more general or cross-cutting questions of effectiveness, which do not relate to specific Articles, but to the effectiveness of the Convention as a whole, such as:

(a) How many Parties are there to the Convention?;

(b) What is the number of parties for which the amendments to list additional chemicals in Annexes A, B or C have entered into force?;

(c) Of the non-parties, are there any major producers, users, importers, exporters, or emitters of persistent organic pollutants?;

(d) Governance: Are all processes and requirements in the Convention implemented? (e.g. rules of procedure, development of guidance, review of articles requiring review, establishment of a compliance mechanism etc.) Are current governance/institutional structures sufficient?;

(e) Recurring issues with products;

(f) Alternatives.

690. The information analysis from the previous sections II.A to II.F was considered in addressing these general and cross-cutting issues as presented below.

1. Parties and non-Parties

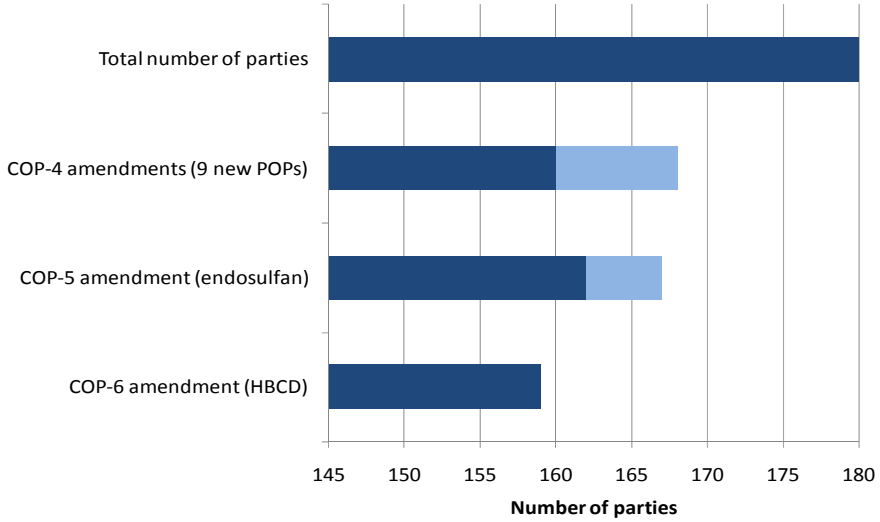
691. The Stockholm Convention is a dynamic treaty as new substances are continuously added to the list of POPs covered by the Convention. Amendments to Annex A, B or C of the Convention enter into force on the expiry of one year from the date of communication by the depositary of such amendments for all Parties except those that 1) have submitted a notification of non-acceptance of the amendment in accordance with Article 22 paragraph 3 (b) of the Convention ("opt-out" Parties); or 2) that have made a declaration with respect to those Annexes in accordance with Article 25 paragraph 4 ("opt-in" Parties). For the opt-in Parties, any such amendment shall enter into force for the Party on the ninetieth day after the date of deposit with the depositary of its instrument of ratification, acceptance, approval or accession with respect to such amendment, in accordance with Article 22 paragraph 4 of the Convention.

[75] UNEP/POPS/COP.8/INF/41.

[76] Ibid.

692. The figure below shows the number of parties for which the amendments to list additional chemicals in Annexes A, B or C have entered into force as at 30 April 2016[77]:

Figure G.1.1. *Number of parties for which the amendments to list additional chemicals in Annexes A, B or C have entered into force (status as of 30 April 2016; light blue bars depict "opt-in" parties)*



(a) Main findings

693. With regards to the obligations described in this report related to paragraph 2 of Article 3 on exports of chemicals listed in Annex A or B, the term "non-Party" includes Parties that have not agreed to be bound by the amendments to the Convention with respect to a particular chemical. For all other purposes throughout the report, the term "non-Party" shall be understood to refer to States and/or regional economic integration organizations that have not agreed to be bound by the Convention overall.

694. As at 30 April 2016, the amendments to Annexes A, B and C to the Convention adopted in 2009, 2011 and 2013 have entered into force for 93%, 92% and 89% of the Parties to the Convention respectively, while those amendments have not yet entered into force for 13, 14 and 19 Parties to the Convention respectively. Those Parties to the Convention which are not yet bound by the amendments are considered 'non-Parties' with regard to the particular chemical. Since non-Parties do not have to report on these chemicals, no information is available. No additional information is available to further assess non-Party states' potential current production, uses, imports, exports and/or emissions of POPs.

695. From the Parties that reported export of POPs for permitted uses, two reported such export to a destination country that was not a Party to the Convention.78 From the Parties that reported imports, seven reported such import from a country of origin that was not a Party to the Convention.79 To date, only one certification of non-Party imports had been transmitted to the Secretariat by a Party pursuant to paragraph 2 (b) of Article 3.[80]

[77] Regularly updated information on the status of ratification, acceptance, approval or accession of the Convention and its amendments is available on the website of the Treaty Section of the United Nations: https://treaties.un.organd this information is also reflected on the Convention's website: http://chm.pops.int/Countries/StatusofRatifications

[78] The non-Party States, which were reported as destination countries with regard to export of persistent organic pollutants for permitted uses, were the United States of America and Malaysia in relation to PFOS, its salts and PFOSF.

[79] The non-Party States, which were reported as countries of origin with regard to import of persistent organic pollutants for permitted uses, were the United States of America, Israel and Italy. The chemicals subject to most recent imports were PFOS, its salts and PFOSF and endosulfan.

[80] UNEP/POPS/COP.7/10.

(b) Conclusions and recommendations

696. Only one certification of non-Party imports had been transmitted to date to the Secretariat by a Party pursuant to paragraph 2 (b) of Article 3. Parties exporting POPs to non-Parties need to provide more information, including the submission of a certification pursuant to paragraph 2 (b) of Article 3.

Recommendation: *There is a need to encourage non-Parties in their efforts to ratify the Convention and/or the amendments to Annexes A, B and C, in particular those producing newly listed POPs. Parties exporting to non-Parties should be reminded of the obligation to obtain an annual certification from the non-Parties and to transmit such certifications to the secretariat.*

2. Governance

(a) Main findings

697. Since its entry into force, the Convention has triggered changes in countries' attitudes and general practices toward environmentally sound management of hazardous chemicals, in particular POPs. Institutional settings built under the Convention have the potential to impact other chemicals in a way that countries are using chemicals, not just POPs, in a better informed environment and with more precaution. Decreasing trends in POPs concentrations measured in countries which adopted measures preceding the adoption of the Convention are proving that those regulatory actions have the desired impact.

698. As a general note, the procedures and requirements set out by the Convention evolve over time through the various decisions adopted by the Conference of the Parties, for instance through decisions adopted to amend the annexes to the Convention to list new chemicals or to update any necessary procedures taking into account the periodic review and evaluation conducted by the Conference of the Parties.

699. The synergies arrangements have been put in place in order to improve governance and implementation of the Basel, Rotterdam and Stockholm conventions. Although this process is not directly linked to the Stockholm Convention obligations, implementation of the synergies process has the potential to influence the effectiveness of the Convention.

700. The synergies process aims to strengthen implementation of the Basel, Rotterdam and Stockholm conventions at the national, regional and global levels, promoting coherent policy guidance, enhancing efficiency in the provision of support to Parties with a view to reducing their administrative burden and maximizing the effective and efficient use of resources at all levels.

701. Expert processes to develop and/or update guidance to support Parties in meeting the obligations under the Convention have been put in place through extensive expert consultations and involvement of Parties and other stakeholders. The Convention has established mechanisms and processes, through the various expert groups, to continue to develop and/or update guidance to address new developments under the Convention, such as listing of new substances in Annexes A, B and/or C, and support Parties in implementing new obligations. All mechanisms and institutions required under the treaty have been put in place to date except for procedures and mechanisms on compliance pursuant to Article 17.

702. This report has identified a number of areas where Parties' implementation of the Convention is significantly lacking and regular follow-up is needed in order to improve the situation which are: ongoing monitoring of elimination of PCB; accuracy of exemption registrations; development and updating of national implementing legislation; update of the NIPs including Article 5 action plans; and review of national reports and reporting rates. The only subsidiary body established pursuant to the Convention, the POPs Review Committee, addresses a range of specific technical issues, although other expert groups and processes are established as needed. Currently there is no body mandated to address implementation issues of a technical and policy nature.

703. The example of the Basel Convention open-ended working group (OEWG), which reviews progress on many issues destined for a Conference of the Parties and provides guidance to a wide range of intersessional activities involving Parties, observers and the Secretariat, could be an option for an approach to increase consensus at the meetings of the Conference of the Parties and improve the implementation of the Convention between the meetings. The OEWG format works by tackling the issues in a reduced intersessional body that is similar to the Conference of the Parties, including consideration of both policy and technical issues towards the further development and implementation of the Convention. In addition to the OEWG, the Implementation and Compliance Committee is entrusted to review general issues of implementation (and compliance) identified by the Conference. This includes monitoring of implementation, identification of implementation difficulties as well as the development of guidance or recommendations to the Conference on how to improve implementation. Other similar models, such as subsidiary bodies on implementation used under the

United Nations Framework Convention on Climate Change and the Convention on Biodiversity are also possibilities, whereas intersessional work under the Stockholm Convention is restricted to technical listing issues.

(b) Conclusions and recommendations

704. Increasing synergies in the implementation of the Basel, Rotterdam and Stockholm conventions has the potential to strengthen effectiveness of the Stockholm Convention.

Recommendation: *The recommendations from the review of the synergies arrangements as approved at the eighth meeting of the Conference of the Parties should be factored in, as relevant, into future effectiveness evaluations.*

705. Although the information base for this evaluation has been limited, it does appear that the Convention provides an appropriate and adequate framework for addressing the production, use, releases, import, export, and disposal of POPs. However, inadequate implementation is the key issue that has been identified in this evaluation and no subsidiary body exists to monitor or improve implementation.

Recommendation: *Implementation of the Convention needs to be closely monitored and improved during the intersessional period between meetings of the Conference of the Parties.*

3. POPs in products

(a) Main findings

706. A major cross-cutting issue is that of POPs in products, which adds uncertainty as to the movement of chemicals across borders. There is a need to know more about products, their movements and associated releases. PFOS and HBCD have been listed in Annex A to the Stockholm Convention, including reference to labelling as an obligation that assists with the issue of identifying chemicals in products. Also related, draft guidance on labelling and guidance on monitoring and screening the newly listed POPs in products has been developed under the Stockholm Convention. While the guidance on monitoring and screening of the newly listed POPs in products and draft guidance on labelling has been developed under the Convention, this is an issue that merits more focused attention. Useful collaboration on chemicals in products with other relevant international activities, such as the Strategic Approach to International Chemicals Management, is also ongoing.

(b) Conclusions and recommendations

707. For some chemicals, labelling has been included as an obligation to assist with the issue of products, and draft guidance has been developed on labelling and on monitoring and screening of POPs in products. However, uncertainty as to the movement of POPs contained in products that cross borders remains high. Useful collaboration on chemicals in products with other relevant international activities is ongoing.

Recommendation: *There is a need for more information about POPs contained in products, their movements and associated releases, ideally during the information-gathering stages of the review process of the POPs Review Committee. The POPs Review Committee would then be better able to consider labelling when making recommendations for control measures. The draft guidance on labelling for the newly listed POPs should be completed. Collaboration on chemicals in products with other relevant international activities should be maintained as appropriate.*

4. Alternatives

(a) Main findings

708. The work on safe alternatives to listed POPs is important particularly in view of the need for improving the quality of risk assessment of alternatives. Challenges have been identified with the alternatives in use as flame retardants. Concentrations of old flame retardants such as organophosphates used as alternatives to BDEs or HBCD are increasing in the environment. They are not technical mixtures like BDEs, which could be monitored as a group, but rather individual chemicals that need to be dealt with individually, adding burden to the associated risk assessment costs.

709. The Convention is intended to address alternatives initially through the socio-economic considerations pursuant to Annex F regarding a chemical nominated for listing. After listing, further work on alternatives may be conducted such as with the example of the work programme on BDEs and PFOS. By listing substances and identifying alternatives for assessment and screening against Annex D, many industries would consider getting out of the production of chemicals that later would be proposed for listing, in particular noting the high costs for research and development. Nevertheless,

the issue of using chemicals already available on the market as alternatives to BDEs and HBCD remains important, as they can be produced at a fraction of the cost.

710. A stronger call for work on alternatives could be made, such as through Article 11, to stimulate further research and information sharing through relevant channels such as the clearing-house mechanism or through the regional and global organization groups under the global monitoring plan. Ultimately, the success of the Convention in the future could be seen through the provisions of paragraph 3 of Article 3, as there would be no longer the need for listing new substances as they would be no longer produced. The consideration of alternatives should also take into account the current status of substances listed under other conventions and international agreements which consider POPs, green-house gases, ozone depleting substances, endocrine disrupting substances, etc.

(b) Conclusions and recommendations

711. The Convention addresses alternatives through the considerations pursuant to Annex F. Additional work on safe chemical and non-chemical alternatives for specific chemicals which are listed in the Convention or being considered for listing may be conducted such as with the example of the work programme on BDEs and PFOS. By listing substances and identifying alternatives for assessment and screening against Annex D, many industries would consider getting out of the production of chemicals that later would be proposed for listing, in particular due to the high costs for research and development.

Recommendation: *A stronger call for work on alternatives could be made through Article 11 to stimulate further research and information sharing through relevant channels such as the clearing-house mechanism or through the regional and global organization groups under the global monitoring plan, with the ultimate goal of eliminating the need for listing new substances as they would be then no longer produced.*

III. Overall outcomes of the effectiveness evaluation

712. The effectiveness evaluation report[81] assesses, in accordance with the framework for effectiveness evaluation,[82] whether the Convention has succeeded in achieving its objective of protecting human health and the environment from POPs, and identifies ways to improve the effectiveness of the Convention.

713. The Convention provides an effective and dynamic framework to regulate POPs throughout their lifecycle, addressing the production, use, import, export, releases, and disposal of these chemicals worldwide. However, inadequate implementation is the key issue that has been identified in this evaluation.

714. Mechanisms and processes required by the Convention to support Parties in meeting their obligations have all been put in place, with the exception of procedures and mechanisms on compliance. A key challenge in undertaking this evaluation was the limited data available from national reports and NIPs, and recommendations have been made to address these and other implementation issues.

715. Monitoring results indicate that regulations targeting POPs are succeeding in reducing levels of POPs in humans and the environment. For POPs listed in 2004, concentrations measured in air and in human populations have declined and continue to decline or remain at low levels due to restrictions on POPs that predated the Stockholm Convention and are now incorporated in it. For the newly listed POPs, concentrations are beginning to show decreases, although in a few instances, increasing and/or stable levels are observed.

716. While the effectiveness of the Convention is evaluated through the Convention's provisions, other international collaboration promoting the sound management of chemicals and waste, contributes to the achievement of the objectives of the Convention.

717. The framework for effectiveness evaluation adopted by the Conference of the Parties provided a good basis for conducting the first evaluation cycle, and based on the experience in using the framework, suggestions have been made to improve it for the next evaluation cycles in document UNEP/POPS/COP.8/INF/41.

[81] UNEP/POPS/COP.8/INF/40.

[82] UNEP/POPS/COP.6/27/Add.1/Rev.1.

IV. References

I. Introduction

UNEP/POPS/COP.4/33 Global monitoring report under the global monitoring plan for effectiveness evaluation

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II. Evaluation of the effectiveness of the Convention

A. Objective

1. Protecting human health and the environment (Article 1)

SC-1/13: Effectiveness evaluation

SC-2/13: Effectiveness evaluation

SC-3/19: Effectiveness evaluation

SC-4/31: Global monitoring plan for effectiveness evaluation

SC-7/25: Global monitoring plan for effectiveness evaluation

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SC-1/25: DDT

SC-2/2: DDT

SC-3/2: DDT

SC-4/19: Establishing indicative elements of a work programme to facilitate the elimination of listed brominated diphenyl ethers and the restriction or elimination of perfluorooctane sulfonic acid and its salts, perfluorooctane sulfonyl fluoride and other chemicals listed in Annexes A or B of the Convention at the fourth meeting of the Conference of the Parties

SC-5/4: Work programme on endosulfan

SC-5/5: Work programme on brominated diphenyl ethers and perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride

SC-6/3: Process for the evaluation of progress parties have made towards eliminating brominated diphenyl ethers contained in articles and the review of the continued need for specific exemptions for those chemicals

SC-6/4: Process for the evaluation of the continued need for perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride for the various acceptable purposes and specific exemptions

SC-6/7: Work programme on brominated diphenyl ethers and perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride

SC – 6/8: Work programme on endosulfan

SC – 7/1: Exemptions

SC – 7/2: DDT

SC-7/3: Polychlorinated biphenyls

SC-7/4: Revised format for the submission of information for the evaluation and review of brominated diphenyl ethers pursuant to paragraph 2 of parts IV and V of Annex A to the Stockholm Convention

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UNEP/POPS/POPRC.8/INF/29 Fact sheets on chemical alternatives to endosulfan

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UNEP/POPS/COP.5/INF/9 Updated compilation of information relevant to the implementation of paragraphs 3 and 4 of Article 3 of the Convention

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UNEP/POPS/COP.7/8 Evaluation of perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride pursuant to paragraphs 5 and 6 of part III of Annex B to the Convention

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SC-3/6: Ongoing review and updating of the Standardized Toolkit for Identification and Quantification of Dioxin and Furan Releases

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1. Specific exemptions and notification of use (Article 4)

SC-1/23: Format for the Register of Specific Exemptions

SC-1/24: Review process for entries in the Register of Specific Exemptions

SC-2/3: Review process for entries in the Register of Specific Exemptions

SC-3/3: Revised process for the review of entries in the Register of Specific Exemptions

SC-4/3: Exemptions

SC-5/8: Exemptions

SC-6/2: Exemptions

SC-7/1: Exemptions

Register for specific exemptions for chemicals listed in Annex A
http://chm.pops.int/Implementation/Exemptionsandacceptablepurposes/RegisterofSpecificExemptions/ChemicalslistedinAnnexA/tabid/4643/Default.aspx

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Register for acceptable purposes for PFOS, its salts and PFOSF
http://chm.pops.int/Implementation/Exemptionsandacceptablepurposes/RegistersofAcceptablePurposes/AcceptablePurposesPFOSandPFOSF/tabid/794/Default.aspx

Notifications of Articles in use
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UNEP/POPS/COP.6/33 Report of the Conference of the Parties to the Stockholm Convention on Persistent Organic Pollutants on the work of its sixth meeting

2. Listing of chemicals in Annexes A, B and C (Article 8)

SC-4/10: Listing of alpha hexachlorocyclohexane

SC-4/11: Listing of beta hexachlorocyclohexane

SC-4/12: Listing of chlordecone

SC-4/13: Listing of hexabromobiphenyl

SC-4/14: Listing of hexabromodiphenyl ether and heptabromodiphenyl ether

SC-4/15: Listing of lindane

SC-4/16: Listing of pentachlorobenzene

SC-4/17: Listing of perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride

SC-4/18: Listing of tetrabromodiphenyl ether and pentabromodiphenyl ether

SC-5/3: Listing of endosulfan

SC-6/13: Listing of hexabromocyclododecane

SC-7/12: Listing of hexachlorobutadiene

SC-7/13: Listing of pentachlorophenol and its salts and esters

SC-7/14: Listing of polychlorinated naphthalenes

UNEP/POPS/POPRC.2/17/Add.1 Risk profile on commercial pentabromodiphenyl ether

UNEP/POPS/POPRC.2/17/Add.3 Risk profile on hexabromobiphenyl

UNEP/POPS/POPRC.2/17/Add.4 Risk profile on lindane

UNEP/POPS/POPRC.2/17/Add.5 Risk profile on perfluorooctane sulfonate

UNEP/POPS/POPRC.3/20/Add.1 Risk management evaluation on commercial pentabromodiphenyl ether

UNEP/POPS/POPRC.3/20/Add.2 Risk management evaluation on chlordecone

UNEP/POPS/POPRC.3/20/Add.3 Risk management evaluation on hexabromobiphenyl

UNEP/POPS/POPRC.3/20/Add.4 Risk management evaluation on lindane

UNEP/POPS/POPRC.3/20/Add.5 Risk management evaluation on perfluorooctane sulfonate

UNEP/POPS/POPRC.3/20/Add.6 Risk profile on commercial octabromodiphenyl ether

UNEP/POPS/POPRC.3/20/Add.7 Risk profile on pentachlorobenzene

UNEP/POPS/POPRC.3/20/Add.8 Risk profile on alpha hexachlorocyclohexane

UNEP/POPS/POPRC.3/20/Add.9 Risk profile on beta hexachlorocyclohexane

UNEP/POPS/POPRC.3/20/Add.10 Risk profile on chlordecone

UNEP/POPS/POPRC.4/15/Add.1 Risk management evaluation for commercial octabromodiphenyl ether

UNEP/POPS/POPRC.4/15/Add.2 Risk management evaluation for pentachlorobenzene

UNEP/POPS/POPRC.4/15/Add.3 Risk management evaluation for alpha hexachlorocyclohexane

UNEP/POPS/POPRC.4/15/Add.4 Risk management evaluation for beta hexachlorocyclohexane

UNEP/POPS/POPRC.4/15/Add.5 Addendum to the risk profile for pentachlorobenzene

UNEP/POPS/POPRC.4/15/Add.6 Addendum to the risk management evaluation for perfluorooctane sulfonate

UNEP/POPS/POPRC.5/10/Add.2 Risk profile on endosulfan

UNEP/POPS/POPRC.6/13/Add.1 Risk management evaluation on endosulfan

UNEP/POPS/POPRC.6/13/Add.2 Risk profile on hexabromocyclododecane

UNEP/POPS/POPRC.7/19/Add.1 Risk management evaluation on hexabromocyclododecane

UNEP/POPS/POPRC.8/16/Add.1 Risk profile on chlorinated naphthalenes

UNEP/POPS/POPRC.8/16/Add.2 Risk profile on hexachlorobutadiene

UNEP/POPS/POPRC.8/16/Add.3 Addendum to the risk management evaluation on hexabromocyclododecane

UNEP/POPS/POPRC.9/13/Add.1 Risk management evaluation on chlorinated naphthalenes

UNEP/POPS/POPRC.9/13/Add.2 Risk management evaluation on hexachlorobutadiene

UNEP/POPS/POPRC.9/13/Add.3 Risk profile on pentachlorophenol and its salts and esters

UNEP/POPS/POPRC.10/10/Add.1 Risk management evaluation on pentachlorophenol and its salts and esters

UNEP/POPS/POPRC.10/10/Add.2 Risk profile on decabromodiphenyl ether (commercial mixture, c-decaBDE)

UNEP/POPS/COP.4/17 Recommendations of the Persistent Organic Pollutants Review Committee of the Stockholm Convention to amend Annexes A, B or C of the Convention

UNEP/POPS/COP.4/18 Draft text for amendments to Annexes A, B and/or C to the Stockholm Convention

UNEP/POPS/COP.5/17 Recommendation by the Persistent Organic Pollutants Review Committee of the Stockholm Convention to amend Annex A to the Convention and draft amendment text

UNEP/POPS/COP.6/17 Recommendation by the Persistent Organic Pollutants Review Committee to list hexabromocyclododecane in Annex A to the Stockholm Convention and draft text of the proposed amendment

UNEP/POPS/COP.7/18 Recommendation by the Persistent Organic Pollutants Review Committee to list chlorinated naphthalenes in Annexes A and C to the Convention and draft text of the proposed amendment

UNEP/POPS/COP.7/19 Recommendation by the Persistent Organic Pollutants Review Committee to list hexachlorobutadiene in Annexes A and C to the Convention and draft text of the proposed amendment

UNEP/POPS/COP.7/20 Recommendation by the Persistent Organic Pollutants Review Committee to list pentachlorophenol and its salts and esters in Annex A to the Convention and draft text of the proposed amendment

D. Enhancing understanding

1. Information exchange (Article 9)

National Implementation Plans under Article 7 of the Stockholm Convention
http://chm.pops.int/Implementation/NIPs/NIPTransmission/tabid/253/Default.aspx

National reports pursuant to Article 15 of the Stockholm Convention
2015.http://chm.pops.int/Countries/NationalReports/ThirdRoundPartyReports/tabid/4470/Default.aspx

SC-2/17: Clearing-house mechanism

SC-3/10: Information exchange

SC-4/21: Information exchange

SC-5/15: Information exchange

SC-7/29: Clearing-house mechanism for information exchange

2. Public information, awareness and education (Article 10)

National Implementation Plans under Article 7 of the Stockholm Convention
http://chm.pops.int/Implementation/NIPs/NIPTransmission/tabid/253/Default.aspx

National reports pursuant to Article 15 of the Stockholm Convention
2015http://chm.pops.int/Countries/NationalReports/ThirdRoundPartyReports/tabid/4470/Default.aspx.
http://chm.pops.int/Countries/NationalReports/ThirdRoundPartyReports/tabid/4470/Default.aspx

3. Research, development and monitoring (Article 11)

National Implementation Plans under Article 7 of the Stockholm Convention
http://chm.pops.int/Implementation/NIPs/NIPTransmission/tabid/253/Default.aspx

National reports pursuant to Article 15 of the Stockholm Convention 2015.
http://chm.pops.int/Countries/NationalReports/ThirdRoundPartyReports/tabid/4470/Default.aspx

UNEP/POPS/COP.8/INF/38 Second global monitoring report under the global monitoring plan for effectiveness evaluation

E. Support for implementation

1. Technical assistance and financial resources (Articles 12–14)

Technical assistance

SC-1/15: Technical assistance

SC-2/9: Technical assistance

SC-3/12: Technical assistance

SC-4/22: Technical assistance

SC-5/20: Technical assistance

SC-6/15: Technical assistance

UNEP/POPS/COP.4/29 Reporting pursuant to Article 15 of the Convention

UNEP/POPS/COP.5/29 Reporting pursuant to Article 15 of the Stockholm Convention

UNEP/POPS/COP.6/INF17 Analysis of obstacles and barriers to gaining access to technical assistance and technology transfer and recommendations on how to overcome them

UNEP-POPS-COP.7/11 Stockholm Convention regional and subregional centres for capacity-building and the transfer of technology

UNEP/POPS/COP.7/13 Technical assistance and capacity-building for the implementation of the Basel, Rotterdam and Stockholm conventions

UNEP/POPS/COP.7/INF/14 Report on the activities of the Basel and Stockholm conventions regional centres

UNEP/POPS/COP.7/INF/15 Report on the technical assistance needs of developing country parties and parties with economies in transition for the implementation of the Stockholm Convention and the technical assistance available from developed country parties and others

UNEP/POPS/COP.7/INF/36 Report prepared by the Secretariat pursuant to paragraph 2 (d) of Article 20 on the information provided in the reports submitted by parties pursuant to Article 15 of the Convention

Financial resources

Global Environment Facility.GEF Database.https://www.thegef.org/gef/project_list.

National reports pursuant to Article 15 of the Stockholm Convention 2015. http://chm.pops.int/Countries/NationalReports/ThirdRoundPartyReports/tabid/4470/Default.aspx

SC-1/9: Guidance to the financial mechanism

SC-1/11: Memorandum of understanding between the Conference of the Parties and the Council of the Global Environment Facility

SC-2/10: Financial resources and mechanism

SC-4/24: Needs assessment

SC-4/26: Review of the financial mechanism

SC-6/17: Needs assessment

SC-6/19: Third review of the financial mechanism

SC-7/21: Additional guidance to the financial mechanism

SC-7/22: Implementation of the integrated approach to financing

UNEP/POPS/COP.3/19 Report of the preliminary assessment of the funding needs of Parties which are developing countries and countries with economies in transition to implement the provisions of the Convention over the period 2006–2010.

UNEP/POPS/COP.4/27 Report on the assessment of funding needs of Parties that are developing countries or countries with economies in transition to implement the provisions of the Convention over the period 2010–2014.

UNEP/POPS/COP.4/29 Reporting pursuant to Article 15 of the Convention

UNEP/POPS/COP.5/27 Facilitating work with regard to financial resources and mechanisms.

UNEP/POPS/COP.5/29 Reporting pursuant to Article 15 of the Stockholm Convention

UNEP/POPS/COP.5/INF/18 Compilation of submissions received by the Secretariat regarding ways in which to support the Stockholm Convention.

UNEP/POPS/COP.6/INF/20 Report on the assessment of funding needs of parties that are developing countries or countries with economies in transition to implement the provisions of the Stockholm Convention over the period 2015–2019.

UNEP/POPS/COP.6/INF/21 Compilation of submissions from parties to the Stockholm Convention on Persistent Organic Pollutants regarding the assessment of funding needs for the period 2015–2019.

UNEP/POPS/COP.6/INF/22 Compilation of submissions received by the Secretariat on ways in which to support the Stockholm Convention.

UNEP/POPS/COP.6/INF/25Draft report on the third review of the financial mechanism.

UNEP/POPS/COP.7/21 Assessment of funding needs.

UNEP/POPS/COP.7/22 Report on the effectiveness of the implementation of the memorandum of understanding between the Conference of the Parties and the Council of the Global Environment Facility.

UNEP/POPS/COP.7/INF/31 Compilation of submissions received by the Secretariat on ways in which to support the Stockholm Convention.

UNEP/POPS/COP.7/INF/32 Report on the availability of financial resources additional to those provided through the Global Environment Facility and ways and means of mobilizing and channelling those resources in support of the objectives of the Stockholm Convention.

UNEP/POPS/COP.7/INF/36 Report prepared by the Secretariat pursuant to paragraph 2 (d) of Article 20 on the information provided in the reports submitted by parties pursuant to Article 15 of the Convention

F. Measuring success

1. Implementation plans (Article 7)

National Implementation Plans under Article 7 of the Stockholm Convention
http://chm.pops.int/Implementation/NIPs/NIPTransmission/tabid/253/Default.aspx

SC-1/12: National implementation plans

SC-2/7: National implementation plans

SC-3/8: National implementation plans

SC-4/9: National implementation plans

SC-6/12: National implementation plans

UNEP 2015. Guidance for the inventory, identification and substitution of Hexabromocyclododecane (HBCD) (draft, April 2015)
http://chm.pops.int/Implementation/NIPs/Guidance/tabid/2882/Default.aspx

UNEP 2013. Draft guidance on sampling, screening and analysis of persistent organic pollutants in products and articles (2013)
http://chm.pops.int/Implementation/NIPs/Guidance/tabid/2882/Default.aspx

UNEP 2012. Guidance for developing a national implementation plan for the Stockholm Convention on Persistent Organic Pollutants (2012, updated in 2012 to include the persistent organic pollutants listed in the annexes to the Convention in 2009 and 2011)
http://chm.pops.int/Implementation/NIPs/Guidance/tabid/2882/Default.aspx

UNEP 2012. Guidance on calculation of action plan costs, including incremental costs and action plans for specific organic pollutants (2012, updated in 2012 to include the persistent organic pollutants listed in the annexes to the Convention in 2009 and 2011)
http://chm.pops.int/Implementation/NIPs/Guidance/tabid/2882/Default.aspx

UNEP 2012. Draft guidance for the inventory for perfluorooctane sulfonic acid and related chemicals listed under the Stockholm Convention (2012)
http://chm.pops.int/Implementation/NIPs/Guidance/tabid/2882/Default.aspx

UNEP 2012. Draft guidance for the inventory of polybrominated diphenyl ethers listed under the Stockholm Convention (2012)
http://chm.pops.int/Implementation/NIPs/Guidance/tabid/2882/Default.aspx

UNEP 2012. Draft guidance for the control of the import and export of persistent organic pollutants (2012) http://chm.pops.int/Implementation/NIPs/Guidance/tabid/2882/Default.aspx

UNEP 2012. Labelling of products or articles that contain POPs – initial considerations (2012)
http://chm.pops.int/Implementation/NIPs/Guidance/tabid/2882/Default.aspx

UNEP 2007. Draft guidance on socio-economic assessment for national implementation plan development and implementation under the Stockholm Convention (2007)
http://chm.pops.int/Implementation/NIPs/Guidance/tabid/2882/Default.aspx

2. Reporting (Article 15)

National reports pursuant to Article 15 of the Stockholm Convention 2015.
http://chm.pops.int/Countries/NationalReports/ThirdRoundPartyReports/tabid/4470/Default.aspx

SC-1/22: Party reporting, timing and format

SC-2/18: Reporting

SC-4/32: Effectiveness evaluation

SC-6/21: National reporting

SC-7/23: Reporting pursuant to Article 15 of the Stockholm Convention

SC-7/24: Effectiveness evaluation

UNEP/CHW/CC.10/7 National reporting: dialogue with other compliance bodies

UNEP/POPS/COP.6/INF/28 Strategy to increase the rate of submission by Parties pursuant to Article 15

3. Non-compliance (Article 17)

SC-1/14: Non-compliance

SC-2/14: Non-compliance

SC-3/20: Non-compliance

SC-4/33: Procedures and mechanisms on compliance with the Stockholm Convention

SC-5/19: Procedures and mechanisms on compliance with the Stockholm Convention

SC-6/24: Procedures and mechanisms on compliance with the Stockholm Convention

SC-7/26: Procedures and mechanisms on compliance with the Stockholm Convention

4. Effectiveness evaluation (Article 16)

SC-1/13: Effectiveness evaluation

SC-2/13: Effectiveness evaluation

SC-4/32: Effectiveness evaluation

SC-6/22: Effectiveness evaluation

SC-7/24: Effectiveness evaluation

UNEP/POPS/COP.3/22/Rev.1 Effectiveness evaluation

UNEP/POPS/COP.3/23/Rev.1 Draft implementation plan for the global monitoring plan for the first effectiveness evaluation

UNEP/POPS/COP.4/33 Global monitoring report under the global monitoring plan for effectiveness evaluation

UNEP/POPS/COP.4/INF/19 Regional monitoring reports under the global monitoring plan for effectiveness evaluation

UNEP/POPS/COP.6/27/Add.1/Rev.1 Effectiveness evaluation: Framework for the effectiveness evaluation of the Stockholm Convention pursuant to Article 16

UNEP/POPS/COP.6/INF/31 Guidance on the global monitoring plan for persistent organic pollutants

UNEP/POPS/COP.6/INF/31/Add.1 Guidance on the global monitoring plan for persistent organic pollutants: Global monitoring plan for persistent organic pollutants as amended after the fourth meeting of the Conference of the Parties to the Stockholm Convention

UNEP/POPS/COP.6/INF/31/Add.2 Guidance on the global monitoring plan for persistent organic pollutants: Implementation of the global monitoring plan for effectiveness evaluation as amended after the fourth meeting of the Conference of the Parties to the Stockholm Convention

UNEP/POPS/COP.7/INF/38 Second regional monitoring reports under the global monitoring plan for effectiveness evaluation

UNEP/POPS/COP.7/INF/39 Guidance on the global monitoring plan for persistent organic pollutants

UNEP/POPS/COP.8/INF/38 Second global monitoring report under the global monitoring plan for effectiveness evaluation

G. General and cross-cutting issues

National Implementation Plans under Article 7 of the Stockholm Convention
http://chm.pops.int/Implementation/NIPs/NIPTransmission/tabid/253/Default.aspx

National reports pursuant to Article 15 of the Stockholm Convention 2015.
http://chm.pops.int/Countries/NationalReports/ThirdRoundPartyReports/tabid/4470/Default.aspx

SC-6/5: Evaluation of the continued need for the procedure under paragraph 2 (b) of Article 3

UNEP/POPS/COP.7/10 Evaluation of the continued need for the procedure under paragraph 2 (b) of Article 3

UNEP/POPS/COP.7/INF/36 Report prepared by the Secretariat pursuant to paragraph 2 (d) of Article 20 on the information provided in the reports submitted by parties pursuant to Article 15 of the Convention

Annex to the report on the effectiveness evaluation of the Stockholm Convention on Persistent Organic Pollutants

Compilation of the data used for the development of the Report on the effectiveness evaluation of the Stockholm Convention on Persistent Organic Pollutants

The dataset used for the development of the Report on the effectiveness evaluation of the Stockholm Convention on Persistent Organic Pollutants is included in Excel format, and can be accessed by clicking on the icon below.

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