

Dioxins and Furans

Highlights of the effectiveness evaluation 2017

Background Information

Article 5 of the Stockholm Convention 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:

- Polychlorinated dibenzo-p-dioxins (PCDD),
- Polychlorinated dibenzofurans (PCDF),
- Polychlorinated biphenyls (PCB),
- Hexachlorobenzene (HCB), and
- Pentachlorobenzene (PeCBz).

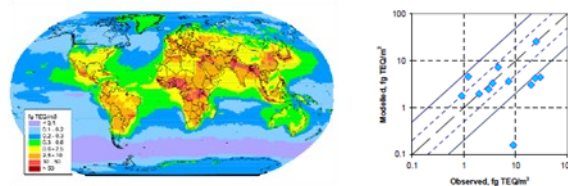
Guidance documents have been developed to assist parties in developing inventories and minimizing releases of POPs from unintentional production pursuant to Article 5 of the Convention:

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/>)

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>)

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. 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:

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)



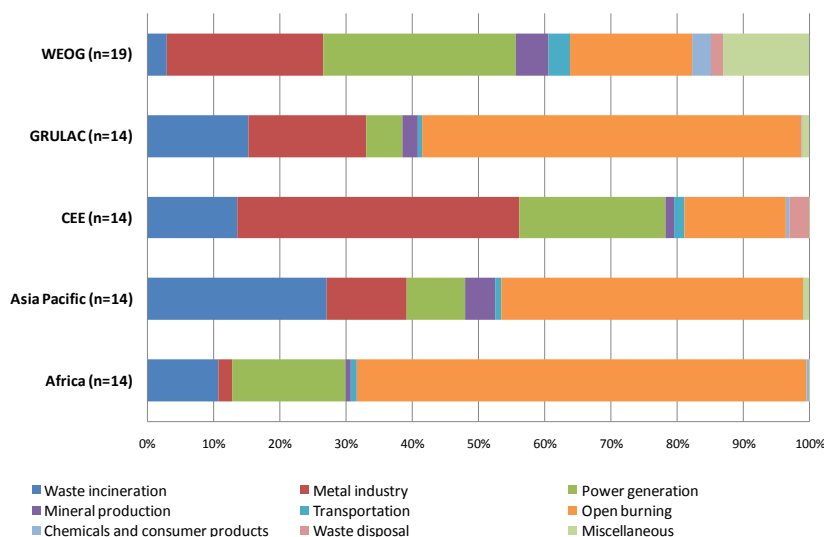
Measures to reduce and/or eliminate releases

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.

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.

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 (UNEP/POPS/COP.8/INF/40).

Contribution by sources to PCDD/PCDF releases to air according to the UN region



Changes in concentrations measured in the environment and in human populations

PCDD/PCDF are detected in air and in human samples worldwide. In regions where long time series monitoring data are available, concentrations of PCDD/PCDF measured in air have largely decreased: a steep decrease in air 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. Changes over time in human exposure to PCDD/PCDF 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. Similar decreasing trends are equally observed for concentrations measured in other media. The overall picture that emerges is that PCDD/PCDF did decrease significantly from peak values in the 1970s to the early 2000s but the measured values since then do not show significant trends.

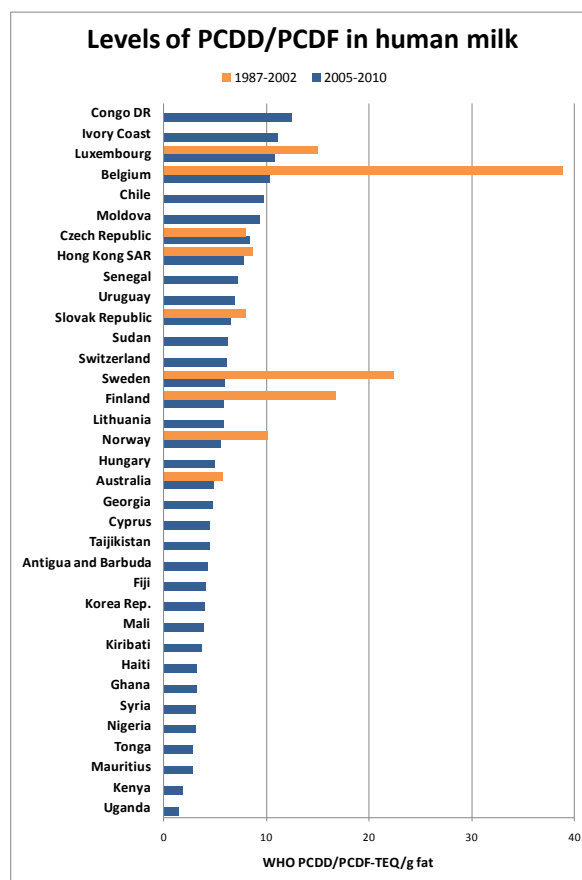
Overall, data from the last decade suggest that the levels of PCDD/PCDF in human milk have fallen steadily from their earlier high levels, indicating the effectiveness of measures implemented to reduce environmental releases. The higher levels observed before 2000 in a number of industrialized countries have been successfully mitigated. The measures implemented in these countries to address releases of and contamination with PCDD/PCDF and PCB are thus shown to be successful in achieving their objectives and could be replicated in other parts of the world with similar positive outcomes.

Conclusions and recommendations of the effectiveness evaluation

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.

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. 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.



(UNEP/POPS/COP.8/INF/38)

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.

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.