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United Nations Environment Programme
Division of Technology, Industry and Economics
Chemicals Branch

PCDD/PCDF Release Inventories **Toolkit Update 2**

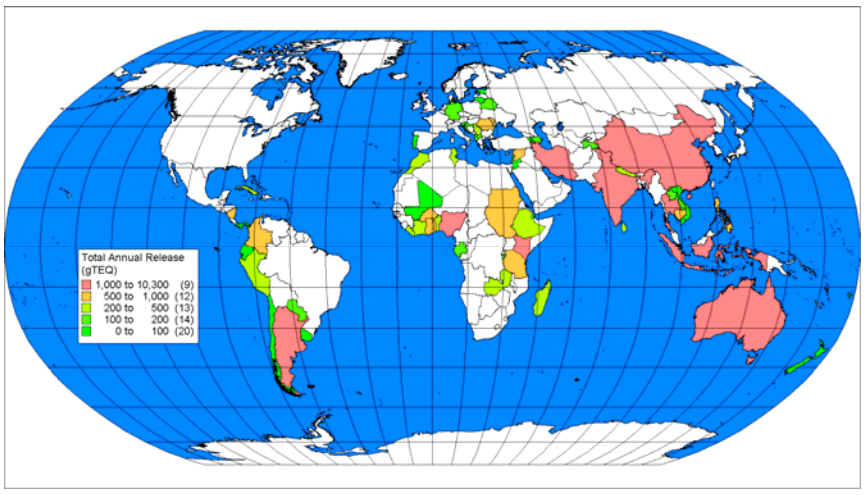
Assessment of PCDD/PCDF Release Inventories – Status 2011

Polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans (PCDD/PCDF) have never been produced intentionally for any reason other than laboratory purposes but occur as a contaminant in many combustion and industrial chemical processes. UNEP has identified the following ten main sources groups (or categories) that release PCDD/PCDF. To support Parties to the Stockholm Convention on Persistent Organic Pollutants, UNEP has developed the "Standardized Toolkit for Identification and Quantification of Dioxin and Furan Releases". It will ensure that source inventories and release estimates are complete, transparent, as well as consistent in format and content; it is the most comprehensive collection of emission factors.

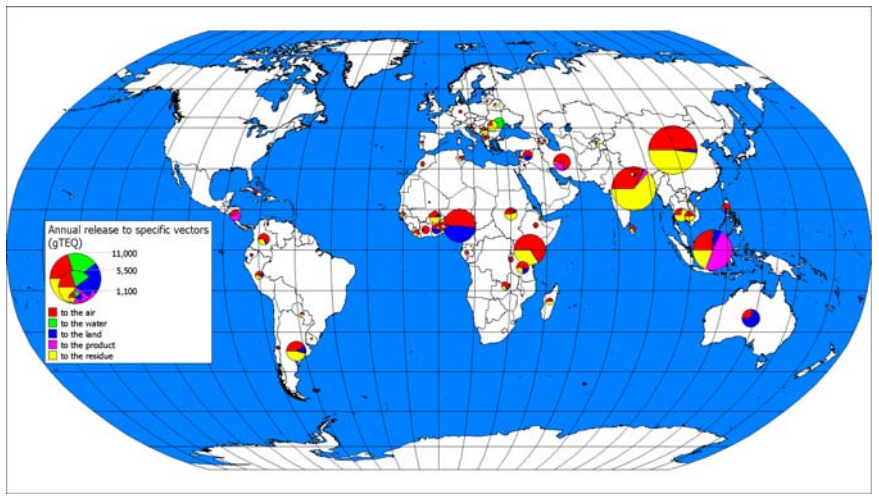
Source Groups of PCDD/PCDF Releases

1 – Waste Incineration
2 – Ferrous and Non-Ferrous Metal Production
3 – Heat and Power Generation
4 – Production of Mineral Products
5 – Transport
6 – Open Burning Processes
7 – Production and Use of Chemicals and Consumer Goods
8 – Miscellaneous
9 – Disposal
10 – Hot Spots

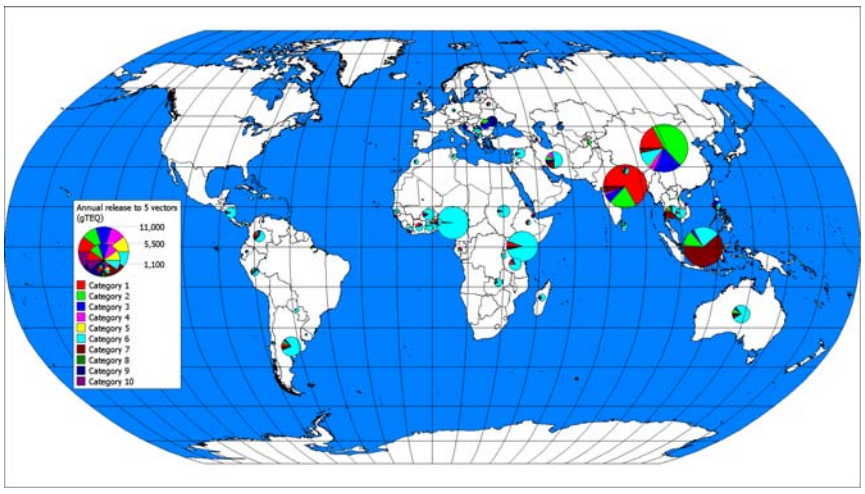
National inventories of 68 countries to estimate releases of PCDD/PCDF were compiled and analyzed. They have been submitted as part of national reporting to the Convention or as part of the national implementation plan. Some were taken from the peer-reviewed literature or from project reports. The following figures show on global maps the source-specific releases of PCDD/PCDF, releases on population-basis (*per capita*) or area (per km^2).



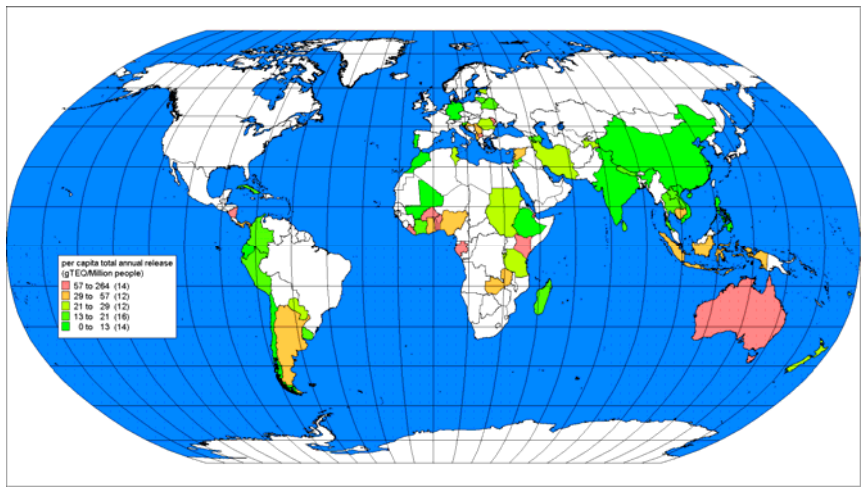
Total annual release from all source groups



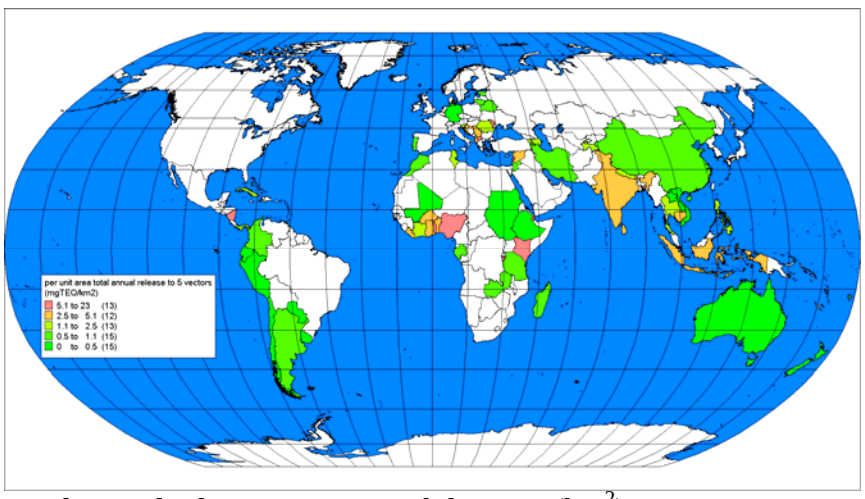
Annual releases to five vectors from all source groups



Total annual releases by source group



per capita total annual release from all source groups



Total annual releases per square kilometer (km^2)

The total releases from these 68 countries are 58,500 g toxic equivalents (TEQ) per year. Of these, 45% are emissions to air, 34% to residues; 11% to land, 8% are in products and only 2% are released to water. The inventory's reference years range from 1999 (Philippines) until 2009 (India).

The most important source group is SG 6 - Open burning of biomass and waste accounting for 48 % of the total releases, followed by SG 1 - Incineration of waste with 12 %, SG 3 - Conversion of energy with 10 %, and SG 2 - (Non-)ferrous metals production with 9 %, respectively. These sources have the largest reduction potential through application of best available techniques and best environmental practices.

For further information, please contact *Science.Chemicals@unep.org* or visit http://www.chem.unep.ch/Pops/pcdd_activities/default.htm