

Methodology

Data collection

The inventory of dioxin emissions for the European countries has been set up by two parallel proceedings: first, emission inventories and results of measurement programs performed so far by the national authorities were collected and compared. Secondly, technical and statistical data on plants and installations as well as statistical data on production and consumption of materials involved in relevant processes were compiled. These data were used for a check on completeness and plausibility of the information submitted by the member states; moreover they were needed as database for the estimation of dioxin emissions for those countries with no sufficient information available. Therefore a variety of industrial confederations as well as statistical offices have been asked for providing relevant data. To date, more than 150 institutions, experts and national authorities have been asked to provide data and documents containing information about dioxin emissions in their country or their industrial branch, respectively.

Reporting

On the basis of data collected at this date an Interim Report was prepared at the end of 1995. In this Interim report aggregated emission data for pre-defined industrial and non-industrial sectors could be presented for about one third of the considered European countries (15 EU members including Norway and Switzerland). These findings were subjected to discussion during a workshop held in April 1996. The attending international experts (see list of participants, Annex) broadly agreed that a survey about the current knowledge about dioxin emissions in Europe would be very helpful to put the focus of future work at the most relevant sources. However, it became obvious that there are other ongoing international projects - i.e. CORINAIR '94 and the EMEP/UNECE Emission Inventory Guidebook- which at least partly overlap with this European Dioxin Inventory. In order to gain maximum use for these other projects and to avoid double work the experts recommended to change the way of data presentation

in the Final Report in accordance with the international standardised CORINAIR-SNAP-system.

Following this recommendation the emission data - originally being presented in different structures, aggregations and arrangements by the various national studies (cf. Table 7) - had to be re-structured. For this reason the Final Report comprises two volumes:

Structure of Volume 1

Volume 1 of the Final Report (this Volume) comprises an analysis of the data covered by Volume I in order to set up a list of those emission sources which probably are the most important. This selection/filtering process is followed then by a re-evaluation of the annual PCDD/F emissions. The re-evaluation aims at getting emission estimates at least for the most important emission sources for all countries including those which provided no or incomplete emission data.

Having calculated the emission values by this process the emission sources are ranked for their relative importance again, followed by comments on uncertainties/data gaps and recommendations for improving the data situation.

Structure of Volume 2

Volume 2 covers the information available from studies on dioxin emissions which have been performed since 1990 in several European Countries, each of which being treated in a separate chapter. Each chapter is sub-structured according to the CORINAIR '94 SNAP codes (see Annex in Volume 2). Furthermore, in order to facilitate comparisons the information is evaluated for each source category in a common scheme (for detailed description see Vol.2).

By this approach only those data given in the national studies and related documents are presented which are considered to be essential for the evaluation of emission estimates; naturally, many details provided by the original documents had to be discarded. The selection of what is essential is in part subjective and the reader should consult the original documents if questions remain. It should be stressed that in this report the information about dioxin emissions in Europe are surveyed in an easy-to-compare way

for the first time. Thus Volume I may serve as kind of a dictionary on the data situation and activities in the Western European countries.

Reference period

Since the basic documents were prepared and released by the national authorities or institutions at different time, the present study refers to a reference period covering the years 1991-1995 rather than to a certain reference year. Fortunately, most studies considered were published in 1995 being almost actual. In the case of the Dutch Dioxin Inventory which is based on the situation of 1991, more recent data were included for the sector of waste incineration. For this reasons it can be stated that the data shown in the present report almost generally reflect the situation in Europe for the period from 1993 to 1995 focusing on the year 1994.

Nomenclature used in this Report

Throughout this report, "dioxins" are referred to in their more correct nomenclature, as PCDDs, PCDFs, or as PCDD/Fs if the sample contains both PCDDs and PCDFs. Emissions of PCDDs and PCDFs to atmosphere and concentrations of PCDDs and PCDFs in stack gases, environmental media or chemical products are given — as far as possible — as I-TEQs, depending on the manner in which they are reported in the technical literature. Data available only in other toxic equivalence systems (like the Nordic system „NTEQ“ or „Eadon-TEQ“ are treated as if they were equal to I-TEQ. This is justifiable since the uncertainties generated by varying measurement results or emission factors usually are much larger than those introduced by the differences between the TE systems.

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Country	Institution	Ref.- year	year of publication	Considered Media/ pathways	based on Measurements/E stimations	Remark
A	Austrian EPA,	1995	1996	<u>A</u>	M, E	Corinair '94 data; in parts very detailed, based on recent research study (unpublished)
B	VITO	1994	1995	<u>A</u> , W, R	M/ <u>E</u>	Measurements only concerning . MSW incineration and traffic
CH	BUWAL	1900- 2010	1996	<u>A</u>	M/ <u>E</u>	Corinair data 85/90/95; handbook on emission factors 1990
D	UBA, Agencies of various Länder, scientific literature	1990- 96	1991-1996	<u>A</u> , W, R	M	most reports contain measurement results only; emission estimates calculated in present report
DK	DK-EPA, scientific literature	1985- 93	1990	A	M/ <u>E</u>	incomplete; measured: MSW inc.; domestic combustion
E	Ministry for Environment	1990	#	<u>A</u>	<u>E</u>	Estimates based on Corinair Activities for 1990; partly implausible
F	ADEME	1995	1996	<u>A</u>	M/E	incomplete, measured: MSW incineration, industrial combustion.
L	L-EPA	1994	#	A	M/ES	consist of a table comprising emission data for the most relevant industrial sources
N	Norwegian Pollution Control Association	1995	#	A, W	?	Consists of a table comprising emission data from industrial sources only; presumably partly based on measurements
NL	TNO/RIVM	1991- 93	1994	A, W, R	M/E	mostly based on measurements, actualised data for MSW incineration included
S	S-EPA: Swedish Dioxin Survey, scientific literature	1994	?	L, W, R, P	<u>M</u> / <u>E</u>	Survey not yet finished; data partly published in literature
SF	VTT	1988- 1992	1992	A	?	incomplete (few sources considered), presumably based on estimations
UK	HMIP	1994	1995	A	M/E	comprehensive, but mainly based on estimations

Table 7 Basic documents on dioxin emissions reviewed in the present study; (#: data not available to public); (*: Environmental Protection Agency)