

## DIOXINS AND FURANS ITALIAN NATIONAL AND LOCAL EMISSION INVENTORIES

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### Introduction

In the frame of the CORINAIR national atmospheric emission inventory, it was supplied a first estimate of Dioxin and Furan emissions in Toxic Equivalent Unit (I-TEq) for Italy, according to the developed international methodologies.

A group of experts was formed to exchange experiences, to validate the data, to individuate the activities needed for more investigation in order to improve the inventory. This group includes experts of formation processes of Dioxin, experts of abatement technologies and experts of measurement analysis, and it is co-ordinated by AIDIC (National Association of Chemical Engineering). In the frame of the activities of this group, regional inventories for Lombardia, Emilia Romagna and Veneto are in progress.

### Materials and Methods

CORINAIR methodology together with SNAP 97 (Selected Nomenclature for Air Pollution) classification of emission activities were adopted. The inventory refers to dioxins and furans emissions in dioxins toxic equivalent (TEq) unit. Emissions are calculated multiplying activity data by appropriate emission factors. In Italy, activity data are usually quite available at a national level; some problem could be found at a local level or in case of more desegregated data requested. Emission factors were generally those proposed by the European Environment Agency or by European scientific literature quoted in references. National emission factors were used where possible. As for some activities, such as urban and industrial waste incineration, emission factors come from national and local studies and measures. As regards public power and cement production, the emission factors used were compared with those referred to the Italian plants. Concerning ferrous and non ferrous metal processes (secondary production processes and sintering) it was very difficult to find useful information as production data, technologies and measurement of emission. In the frame of the above mentioned expert group, a more detailed analysis concerning these activities was started in order to reduce uncertainty about their emissions. This investigation is particularly important because in 2010 emissions from metallurgy will probably be more than 50% of the total national emission.

### Results and Discussion

In the following table are reported the figures related to the national inventory for 1990, 1995 and a projection for 2010. Waste incineration is today the most important source of emission for Italy (70% of emission) but in the future it will amount only to 14%. In 2010 total emissions will reduce from around 550 grams to around 150 grams of dioxins toxic equivalent and the most of that will be due to ferrous and non ferrous sinter and secondary production (50%). This is the reason why we need to investigate to define the real weight of these activities and how to reduce emissions.

The amount of emission in air of residential combustion will be relevant, in particular because of wood combustion. Also in this case the uncertainty is very high, both for activity data and emission factors.

### DIOXINS AND FURANS

(I-Teq grams)

	1990	%	1995	%	2010	%
<b>PUBLIC POWER</b>	23,4	5	26,6	5	14,5	10
<b>RESIDENTIAL COMBUSTION</b>	23,6	5	26,4	5	18,5	13
<b>INDUSTRIAL COMBUSTION</b>	92,0	20	81,7	15	61,4	43
combustion plants	13,6	3	10,8	2	10,3	7
cement	6,1	1	5,1	1	5,3	4
sinter plants	67,9	15	60,5	11	40,5	28
secondary lead	2,0	0	2,5	0	2,5	2
secondary copper	1,7	0	2,0	0	2,0	1
secondary aluminium	0,7	0	0,8	0	0,8	1
<b>PRODUCTION PROCESSES</b>	29,5	7	28,6	5	28,6	20
electric furnaces	29,5	7	28,6	5	28,6	20
<b>ROAD TRANSPORT</b>	6,4	1	5,1	1	0,0	0
<b>WASTE TREATMENT AND DISPOSAL</b>	276,0	61	390,5	70	20,5	14
municipal solid waste incineration	134,3	30	170,6	31	12,8	9
industrial waste incineration	97,4	22	97,4	17	4,6	3
medical waste incineration	27,5	6	27,5	5	1,3	1
sewage sludge	16,8	4	95,0	17	1,8	1
agriculture waste incineration	0,0	0	0,0	0	0,0	0
<b>TOTAL</b>	450,8	100	558,8	100	143,4	100

Next year the expert group will continue its activities with the aim to extend the inventory to water and soil, to supply balance of emission at local level and to involve industry in programmes of dioxin emission reduction, on the basis of the best available technologies.

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