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Summary of the results of the studies on dioxins in the New Member States

1. SUMMARY

At a very general level it can be stated that the situation regarding dioxin emissions, environmental levels and human exposure in the new Member States and Candidate Countries is comparable to the one in the old Member States. Globally, emissions to air, environmental contamination and human exposure are at about the same levels. The releases to water and land are estimated to be significantly lower, although there is high uncertainty to this estimate. The uncertainties are also high for the other areas and low availability and comparability of data often make it difficult to draw conclusions.

Some of the new Member States seem however to have a specific problem with “hot spots”, i.e. sites that are seriously contaminated, especially with PCBs. Uncontrolled burning of waste and domestic heating with wood and coal are also mentioned as possible specific concerns, but the results are inconclusive.

A number of priority areas for action have been defined in two projects launched by the European Commission (see below), including the identification and destruction of existing stocks, the establishment or extension of data bases and monitoring systems, the implementation of existing legislation, educational measures (targeting local administrations and the public) and the cleaning up of contaminated sites.

At a workshop organised on 2nd February 2005 the following priorities were identified as being of highest importance:

- Implementation of existing legislation
- Attention to small sources, in particular the malpractice of open waste burning and co-combustion, for instance through initiatives to raise awareness possibly coupled with financial incentives
- Improved understanding of the importance of domestic heating, followed by appropriate measures, integrated with the air quality strategies
- Establishment of harmonised and focused monitoring by using a few indicators

According to these results, there is no significant difference between the problems being faced by the new Member States as a group and the old Member States. There is therefore no particular reason to address the two areas differently, and dioxin policy can in principle be developed similarly for the EU as a whole.

2. BACKGROUND

At the EU Environment Council in December 2001 conclusions on the Dioxin Strategy¹ were adopted. The conclusions emphasised among other things the need to gather knowledge on the situation on dioxins and PCBs in the new Member States and to contribute to capacity building in the area.

It is against this background that two studies were launched: one to make an overview of the *environmental contamination and human exposure to dioxins, furans and PCBs* (Bipro report) and one to make an inventory of *dioxin and furan emissions to air, water and land* (TNO report). PCBs are not included in the scope of the second report. The study on environmental contamination and human exposure was finalised in June 2004 and the emissions inventory was finalised in May 2005.

Together these studies give a complete overview of the situation. A workshop has been organised to look at the results jointly in order to draw conclusions, identify problem areas, discuss the appropriateness of existing measures and identify options for possible additional measures.

At EU level there are two major legal instruments to control dioxin emissions from industrial sources – the Waste incineration directive² and the IPPC-directive³. There are also several other pieces of legislation where dioxins, furans and PCBs are regulated, for example the directive on the disposal of PCBs and PCTs⁴ that obliges Member States to submit an inventory and detailed plans for the disposal of such waste, and the provisions on maximum levels of dioxins and furans in feed and food⁵.

Moreover, the POPs regulation⁶ was adopted in April 2004, aiming at reducing unintentional releases of dioxins and PCBs “as soon as possible with the ultimate aim of elimination”. National and EU level plans to implement this provision are under preparation and the results of the studies are also of relevance for this work.

In the context of legislation it is also interesting to note that several of the countries have national legislation in fields not covered by EU legislation, for example limit and action values for dioxins and/or PCB contamination in ambient air, workplace air, soil, water and human blood. Besides the limits for environmental compartments nearly all countries have set limit values for indicator PCBs in food that does not exist in EU legislation.

¹ Communication on a Community Strategy for dioxins, furans and polychlorinated biphenyls (COM(2001) 593).

² Directive 2000/76/EC on the incineration of waste.

³ Directive 96/61/EC concerning integrated pollution prevention and control.

⁴ Directive 96/59/EC on the disposal of polychlorinated biphenyls and polychlorinated terphenyls

⁵ Regulation (EC) No 2375/2001 amending Regulation (EC) No 466/2001 setting maximum levels for certain contaminants in foodstuffs and Directive 2002/32/EC on undesirable substances in animal feed, as amended by Directive 2003/57/EC.

⁶ Regulation (EC) No 850/2004 on persistent organic pollutants.

3. MAIN RESULTS

3.1. Introduction

In 2001 it was stated in the Dioxin Strategy the EU enlargement was likely to increase the average exposure to dioxins and PCBs. It was also assumed that the joining countries could be high contributors to the total dioxin emissions due to many obsolete industrial plants. In a preliminary assessment⁷ of the situation it was furthermore suggested that waste incineration – which used to be the main source for dioxin emissions before it was regulated in the EU – would not be such an important source in the eastern and central Europe simply because waste incineration is not so widespread. Non-industrial sources, especially residential heating with coal or wood and open burning of waste, were on the other hand estimated to contribute with a high share.

The results of the two studies contradict these assumptions in certain cases, which will be further elaborated below. First it needs however to be stated that it is difficult to make a general interpretation of the results because the situation is very inhomogeneous across the area, with many regional differences. There is also a problem with availability and comparability of contamination and exposure data. The emission inventory has been established in a harmonised way, but there is still much uncertainty to the results due to estimations of emission factors and activity data, most particularly for emissions to water and land.

The conclusions must therefore be taken with precaution and it should be understood that they are very general and do not always reflect all regional particularities.

3.2. Environmental contamination and human exposure to dioxins, furans and PCBs

Information has been collected on contamination levels in air, water, sediments, soil, vegetation and wildlife to assess the state of the environment and on food and feed contamination and human tissue levels to assess the level of human exposure.

In general it can be concluded that the contamination levels in the new Member States and Candidate Countries do not exceed the levels in the old Member States. In some countries they might even be significantly lower, e.g. Hungary and Bulgaria. There exist however a number of areas with very high contamination (“hot spots”), especially with PCBs, e.g. in Czech Republic, Slovakia and Slovenia.

The few data that exist on contamination in food with dioxins and furans indicate that the EU limit values are not being exceeded in most cases. There is however too little information to enable proper conclusions.

For assessing human exposure comparable data exist from the WHO milk studies. The total exposure seems to be significantly lower than in the old Member States with the exception of the Czech Republic and Slovak Republic where PCB levels correspond to the levels in the old Member States.

⁷ JRC Report «Dioxin emissions in the Candidate Countries», EUR 20779.

On an average, the time trends for human exposure show a strong decline over the last decade whereas the time trends of environmental contamination seem to be quite stable and in part even slightly increasing over the last years.

Against the background of these results the concern that average exposure would increase in the enlarged EU does not seem to be justified.

3.3. Emissions to air and releases to land and water of dioxins and furans

An emissions inventory has been set up using emission factors from literature that have been adapted taking into account information from local experts. These emission factors have also been supported by a number of actual measurements of emissions from the most relevant sources.

On a global and per capita basis the amount of dioxins emitted to air in the new Member States and Candidate Countries is at the same level as in the old Member States.

Major contributing countries are the largest ones, namely Poland and Turkey. Heavily populated and industrialised areas seem to have the highest emissions. The most important sectors are

- incineration of waste (48 %), with incineration of hospital waste (16 %) and open burning of domestic wastes (14 %) accounting for the largest shares,
- metal production (22 %), with iron ore sintering (13 %) being the predominant source,
- fuel combustion activities (12 %), with residential heating accounting for 6 %.

Incineration of municipal waste in controlled facilities accounts for only a small share (1,3 %).

About one third of the emissions is due to non-industrial sources (residential heating, uncontrolled waste burning, road transport etc.). Among these, emissions from residential heating in small stoves or centralised heating systems account for a relatively small share, but monitoring of ambient air levels shows considerably higher levels in winter time than in summer, indicating that this may be a problem, at least at local level.

The actual measurements that were performed showed that metallurgical plants are of particular importance for the release of dioxins to air. The same has been shown for the old Member States. However, none of the concentrations measured appear to be surprisingly high compared to previous measurements made in the old Member States. Furthermore, when compared to the emissions factors taken from literature (UNEP toolkit), the actual measurements showed acceptable to good agreement. The measurements therefore indicate that applying the UNEP toolkit does not lead to significant over- or underestimations. It has however to be noted that only a small number of existing emission sources were investigated, and the results may not be representative for the situation in the entire region.

According to a simple analysis of future trends it is estimated that the dioxin emissions have decreased in the period 1990-2000 mainly due to a slowdown of the economy. In the period up to 2030 the economy is expected to pick up and emissions increase again with one quarter. This may however be set back by introduction of best available

technology and the total emissions of dioxins to air might decrease with about 50 % if all countries comply with the requirements of the IPPC directive as given in the respective BREF documents.

As regards the releases to water and land there is an extremely high level of uncertainty to the estimations, so it is doubtful whether the results can be used as a basis for policy. Potential sources for emission to land seem however to be

- disposal of municipal solid waste to landfill (28 %),
- domestic combustion of coal (25 %),
- incineration of domestic and municipal waste (7 %).

These identified major sources for releases to land and to water are similar to those of the old Member States. Combustion of coal for domestic use seems however to be a particularity for the new Member States and Candidate Countries. The estimated total releases are also considerably smaller in the new Member States and Candidate Countries (17 % of the EU total).

3.4. Monitoring, research and capacity building

Compared to the old Member States monitoring of classical PCBs is generally more abundant, while the inverse is true for dioxins, furans and dioxin-like PCBs. Concerning monitoring and research activities the highest level of activity can be found in the Czech and Slovak Republic, Poland, Hungary, Slovenia and Estonia. Other countries restrict their activities to specific compartments or only started monitoring activities in the framework of the GEF funded projects for the development of national implementation plans under the Stockholm Convention. Specific deficits exist in most countries with respect to monitoring of dioxins (most monitoring has been restricted to PCBs) and with respect to human exposure. The situation may have changed after the EU accession.

In the field of analytical capacities, necessary for the monitoring of introduced measures, it seems that there are adequate capacities for PCB analysis in all of the countries, even if they might not always meet the quality standard requirements of the EU legislation. There is however a deficit of dioxin analysis capacity in the majority of the countries and a problem with the correct handling of samples has been reported in some cases.

3.5. Priorities

According to the Bipro report, a number of priorities have been identified in the framework of the Stockholm Convention on POPs, *inter alia* the identification and destruction of existing stocks, the establishment or extension of data bases and monitoring systems, the implementation of existing legislation, educational measures (targeting local administrations and the public) and the cleaning up of contaminated sites.

The most urgent issues identified in the Bipro report is the decontamination of major “hot spots” and destruction and safe storing of PCB containing waste and equipment. It is also being stressed that implementation and enforcement of the regulatory framework will have to be further promoted by educational measures and improved knowledge exchange.

For emissions to air, the TNO report states as the highest priority the implementation of the EU Waste incineration directive and the IPPC directive. Another priority source reduction measure mentioned in the Bipro report is the progressive phasing out of PCB containing equipment. For releases to water and land no policy priorities are given in the TNO report. To fill data gaps and decrease the level of uncertainty for the estimates the report suggests collection of better activity data, measurement campaigns and further research in a number of areas.

4. WORKSHOP

A workshop was organised on 2nd February 2005 in Brussels to assess if the results above give a correct picture of the situation, if any clear problems and priority areas can be defined, if existing national and European instruments are appropriate to address the situation and - if not - what alternative approaches can be suggested.

The discussions of the workshop once again confirmed that there are many uncertainties and knowledge gaps in the field of dioxins and PCBs, and that there is no straightforward answer to what the next steps should be. It should be noted that there was relatively low participation from the food and health sector, so the discussions lacked somewhat this perspective.

The assessment of the situation in the new Member States shows that the present EU approach targeting industrial sources of dioxins through the waste incineration directive and the IPPC-directive is appropriate also for this region. Non-industrial sources as dioxin emitters are presently not addressed at EU-level, but any action in this area is relevant for both the old and the new Member States.

The priorities identified are the following:

- Implementation of existing legislation
- Attention to small sources, in particular the malpractice of open waste burning and co-combustion, for instance through initiatives to raise awareness possibly coupled with financial incentives
- Improved understanding of the importance of domestic heating, followed by appropriate measures, integrated with the air quality strategies
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