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SUMMARY OF WORKSHOP ON PRTR-RELATED ESTIMATION TECHNIQUES

Canberra, Australia

15-17 December, 1999

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This document provides a summary of the discussions at the Release Estimation Techniques Workshop that took place in Canberra, 15-17 December 1999. The purpose of this workshop was to: (1) review and comment on three documents prepared under the PRTR Release Estimation Techniques for Point and Diffuse Sources project; (2) share experiences of countries on the development and application of release estimation techniques; and (3) identify what can be done internationally to help governments more efficiently use resources (both human and financial) spent on developing release estimation techniques.

***ACTION REQUIRED:***        *The Joint Meeting is invited to:*

- (i) take note of the discussions at the workshop; and*
- (ii) express initial views on the recommendations from the workshop,*
- (iii) suggest priorities for future work.*



## BACKGROUND

A key aspect of a PRTR programme is the use of release estimation techniques for generating the data. Most companies required to report PRTR data use estimation techniques (e.g., emission factors, mass balance calculations, etc.) to estimate releases in lieu of submitting specific monitoring data. As different industrial processes and activities involve different kinds of throughput, equipment and operating conditions, different methods for estimating releases are required. PRTR databases can be considered only as good as the methods that are used to estimate releases.

Governments with PRTRs under development have found that developing new estimation techniques can be extremely resource intensive as can be identifying and collecting approved techniques from other countries. For these reasons, OECD initiated a project on Release Estimation Techniques for Point and Diffuse Sources. The objectives of this project are to identify and review techniques currently in use or under development and make them widely available and to identify how methods could be more easily adapted and shared between Member countries.

To collect information from Member governments on release estimation techniques for point and diffuse sources, a survey was developed. (A similar survey was developed and distributed to industry representatives.) Based on the results of this survey, a draft compendium of release estimation techniques was produced. The objective of this compendium is to help Member countries identify or establish similar methods for estimating releases from industrial point sources and diffuse sources. In addition to the compendium, a draft manual on selecting estimation techniques was developed to provide guidance to governments and PRTR reporters on basic issues and activities associated with the selection of an estimation technique.

In parallel to this PRTR activity, the OECD Task Force on Environmental Exposure Assessment is working on emission scenario documents (ESDs) for specific use and industry categories. The data generated by an emission estimation technique are an important input to an ESD and the quality of data from the technique can affect the ESD. Therefore, the work of this PRTR project can be a positive input to the work of the Task Force.

## WORKSHOP

As part of this project, a workshop on Release Estimation Techniques for Point and Diffuse Sources was held in Canberra, from 15 to 17 December, 1999. Mark Hyman of Environment Australia chaired the workshop, which was hosted by Environment Australia. Chris Evers (European Commission) was the co-chair. The workshop agenda can be found at Annex 1.

Thirty-seven government and industry representatives from 10 Member countries attended the workshop. (Unfortunately, no NGO representatives were able to attend.) Workshop participants included a mix of PRTR policy and technical experts and environmental exposure assessors. Environmental exposure assessors were specially invited to participate. The link between the work of the Task Force on Environmental Exposure Assessment and that under the PRTR Release Estimation Techniques project was outlined by the Secretariat at the last Joint Meeting. This workshop was a further step to link the work of these two project areas.

The objectives of the workshop were to:

- Review and comment on three OECD documents on PRTR release estimation techniques for point and diffuse sources (Draft Compendium of Release Estimation Techniques for Point and Diffuse Sources, Draft Manual on Selecting Release Estimation Techniques and the Background Paper for the workshop);

- Identify the differences between techniques used for estimating releases of similar sources and the reasons for these differences;
- Identify factors that affect the accuracy and reliability of estimation methods and examine issues affecting the adaptability and applicability of methods between countries;
- Examine ways to improve the communication of techniques available and to increase the sharing of methods between countries; and
- Recommend ways to improve estimation techniques and their adaptability between countries.

### **Summary**

This section contains a brief summary of the workshop discussions. Summary outlines of each session, as prepared at the workshop by the session reporters, can be found at Annex 2.

#### *Transferability of release estimation techniques*

It was generally agreed that about 60% of the PRTR release estimation techniques for point sources could be transferred from one country to another. It is estimated that about one-third of the countries with similar industries could readily use estimation techniques from another country. Another one-third of the release estimation techniques for point sources can be used by adjusting the data and information inputs to take into account particular local conditions or particular aspects of an industrial process (e.g. type of fuel used). Finally, about one-third of the estimation techniques developed by one country could not be used by another country due to the specific characteristics of an industrial process or activity.

There are many factors that can affect the transferability of emission estimation techniques from one country to another. These factors fall into two different categories: macro-level and micro-level. Macro-level factors would be, *inter alia*, climatic conditions, raw materials used, source reduction methods, etc. At the micro-level (or process level), factors would include; process design, material feed rates, operating schedules, etc. Participants recommended that further work be undertaken to identify and define more clearly these factors (general and per industrial activity). It also was emphasised that guidance developed at the OECD-level on such factors could assist countries to more readily adapt techniques developed by another country.

#### *Accuracy*

The accuracy of a release estimation technique depends on how closely the operating characteristics of the particular source matches the conditions of the technique. Certain conditions and factors (e.g. climatic conditions) can cause a *mismatch* between the operating conditions of the estimation technique and the particular source being estimated, therefore affecting the accuracy. Workshop participants noted that it is the goals of a PRTR system that drive the level of precision needed in reported data. For instance, PRTRs with the goal of community right to know might need a different level of precision in reported data than those PRTR systems where monitoring policy performance or meeting specific regulatory targets are the goals. Consequently, the type of techniques used or approved for estimating PRTR data could vary from country-to-country. Governments should take this into account when determining which estimation techniques for point and diffuse sources are acceptable.

### *Emission factors*

There was a great deal of discussion on the use and merits of emission factors. Workshop participants agreed that further work at the international level should be undertaken to, among other things, identify the strengths and weaknesses of factors, to identify if new factors might be needed and to develop a critical evaluation guide and criteria for evaluating a factor.

### *Releases from diffuse sources*

Participants agreed that release data from diffuse sources, while not included under all PRTR systems, provide important insights into the distribution of specific pollutant releases. Although methods used to estimate diffuse sources (small and medium-sized enterprises, transportation, agriculture) are often country-specific and focused on local conditions, they can often be adapted from one country to another. Information about techniques used in other countries can assist countries to develop a framework for a technique and identify the type of inputs needed to make a good estimation.

One of the most significant comments received on the draft *Compendium of Release Estimation Techniques for Point and Diffuse Sources* is that it lacked sufficient information on diffuse source estimation techniques. Participants proposed that further information concerning diffuse source techniques used in Member countries be identified and included in the draft compendium. In addition, summaries of the techniques and any background documentation should be added

### *Communication tools*

Workshop participants noted that communication tools to widely promote the availability of estimation techniques can increase the amount of reporting and improve the accuracy of PRTR data reported. Handbooks and guidance documents are two of the key methods used by governments. Participants suggested that when developing guidance for release estimators, governments should make it easily accessible to release estimators (e.g. Australia places its handbooks on the World Wide Web) and involve reporters (those who estimate releases) to help ensure its applicability and practicality.

Participants also noted that it is particularly important that the guidance developed by governments matches the skills and level of understanding of the release estimator. For instance, some guidance documents and information can be overly technical and complicated for estimators in a medium sized enterprise and not sufficiently technical for large multi-national enterprises. The need to make the background information and assumptions used in the development of an emission factor available and accessible was also emphasised.

### *PRTR data and environmental exposure assessments*

During the session on PRTR Data and Environmental Exposure Assessments, participants raised the issue that PRTR data would not be useful for short-term assessments but could potentially be used in long-term assessments and/or as a screening tool to indicate whether or not a risk or exposure assessment is needed.

At the workshop, environmental exposure assessors raised two important issues with respect to the sharing of PRTR data and information between countries. The first issue concerns the need to harmonise (or coordinate) industrial activity categories. (NB If categories are not harmonised, information is needed as to what is meant by a specific activity or use category.) The second issue concerns the lack of harmonised methods used by laboratories (nationally and internationally) for analysing measurement or monitoring data. As discussed at the workshop, different methods of measurement can affect the base information used to develop an emission factor. Transparency of the background documentation concerning the development of an estimation technique could help remedy this potential obstacle.

Due to the linkages between the work of environmental exposure assessors and data derived from release estimation techniques, it was strongly recommended that there be continued co-ordination between environmental exposure assessors and the work on PRTR release estimation techniques

## RECOMMENDATIONS

Workshop participants recommended that OECD:

1. Expand the current draft compendium of release estimation techniques to include additional **estimation techniques for diffuse sources**. While the current draft compendium provides a good range of information concerning release estimation techniques for point sources, supplemental information is needed on techniques used for estimating releases from diffuse sources. The compendium should also, to the extent possible, include summaries of estimation methodologies and background documentation on how techniques were developed as well as new or updated estimation techniques for processes, specific pollutants, or categories of pollutant.
2. Develop a **clearinghouse** to keep the compendium and other information about release estimation techniques up-to-date. The clearinghouse should be placed on the World Wide Web and contain the following:
  - contact points in Member countries and the co-ordinates of a central group at OECD;
  - an international road map of where information on techniques can be found;
  - summaries of estimation methodologies, as available;
  - background documentation on technique development, including assumptions, as available;
  - information on new sources/links to web sites, new methods or emission factors being developed (updated or modified); and
  - guidance documents that countries are planning to develop or that are under development.
3. Establish an **OECD Task Force** to manage work and co-ordinate with other international activities on release estimation techniques. The Task Force should include PRTR policy and technical experts as well as environmental exposure assessors.
4. Develop a **guidance document** that describes factors (and other variables) that can affect the use of a release estimation technique in one country that was developed in another (e.g. climatic conditions, type of fuel used).
5. **Evaluate emission factors** currently used. This work should include the following activities:
  - Prioritise what processes, pollutants or categories of pollutants/chemicals should be reviewed;
  - Summarise strengths and weaknesses of selected techniques (accuracy, reliability, merits, etc.);
  - Identify what additional information is needed with respect to the emission factor;

- Identify whether a factor should be updated (or, in the case where a factor is missing, develop a new factor);
  - Review industrial classification codes and provide guidance on harmonising or co-ordinating codes; and
  - Develop a critical evaluation guide and criteria for evaluating a factor.
6. Establish **an informal communication mechanism** (e.g. an Internet chat room) for all countries to use to exchange information on release estimation techniques, ask questions, share lessons learned, provide information about new work or activities, etc. The workshop highlighted the advantages to establishing a network of experts to share information and discuss issues concerning the estimation of pollutant releases.
  7. Develop **general guidance** to help governments develop guidebooks and other communication tools that will assist PRTR reporters select and use estimation techniques.
  8. Conduct a **scoping study on the use** of PRTR data (with specific reference to how it can be used as a screening tool for determining when detailed studies such as exposure assessment or risk assessment are required.)

The study should identify:

- potential uses of PRTR data;
- the need to combine PRTR data with health and environmental effects data to assist in priority setting, policy development, etc.; and
- approaches that may be, or have been, adopted that use toxicity data with PRTR data. Strengths and weaknesses of these approaches should be assessed.

## CONCLUSION

The workshop was a pivotal point in OECD's work on PRTR release estimation techniques. It illustrated that work on this topic at the OECD level can bring valuable benefits to Member countries by increasing the range of PRTR release estimation techniques available to them and by identifying how techniques established by other countries can be more easily used. Based on the recommendations from the workshop, future project work on PRTR release estimation techniques would be divided into three categories: dissemination, co-ordination and analytical.



**ANNEX 1**



## WORKSHOP AGENDA

### Morning Session - Wednesday, 15 December, 1999

<b>9H30-10H00</b>	<b>SESSION I</b>	<b>WELCOME AND INTRODUCTION</b>
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**Welcome:** Mark Hyman, Environment Australia  
**Introductory Remarks:** Claudia Fénérol, - *OECD's Project on PRTR Release Estimation Techniques for Point and Diffuse Sources*

<b>10H30-11H15</b>	<b>SESSION II</b>	<b>REVIEW OF THE BACKGROUND DOCUMENTS</b>
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Presentation of workshop documents. Discussion and comment.

<b>11H15-11H30</b>	<b>Break</b>
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<b>11H30-17H30</b>	<b>SESSION III</b>	<b>ESTIMATING</b>
	<b>RELEASES FROM POINT SOURCES</b>	<b>PART 1 AND 2</b>

<b>11H30</b>	<b>PART 1</b>
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**Soundness of an estimation technique: accuracy and reliability**

Presentations

Objective: to examine the similarities and differences between methods used by countries and identify factors affecting the soundness of an estimation technique

*Discussion points:*

- What are the key similarities and differences between release estimation methods currently used in Member countries?
- What are the key issues with respect to the accuracy and reliability of an estimation technique for point sources and/or diffuse sources?
- What factors *affect* the accuracy of estimation methods?
- What factors *affect* the reliability of an estimation technique?
- What can be done to improve accuracy and reliability?

<b>12H30-14H00</b>	<b>Lunch</b>
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<b>14H00-15H00</b>	<b>Session III -- Continuation of Part 1</b>
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**Afternoon Session – Wednesday, 15 December, 1999**

**15H00 SESSION III (CONTINUED) ESTIMATING RELEASES FROM POINT SOURCES**

**15H00 PART 2**

**Adaptability and applicability of estimation methods used for PRTRs, including emission factors, between Member countries**

**Objective:** to identify issues affecting the adaptability and applicability of estimation methods between countries.

Presentations

*Discussion points:*

- How prescriptive should PRTR programmes be with respect to the type of estimation technique that can be used by reporters? Could flexibility of methods affect (positively or negatively) the accuracy of data produced?
- What *factors influence* the applicability of methods between countries?
- What types of information should accompany a method to clarify its applicability?
- What steps can be taken to improve the applicability and compatibility of methods shared between countries?

**15H00-15H30 Break**

**17H30 Close of Session III**

*18H00 Reception - hosted by Environment Australia*

<b>Morning Session - Thursday, 16 December, 1999</b>
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<b>9H30-12H30</b>	<b>SESSION IV</b>	<b>ESTIMATING RELEASES FROM DIFFUSE SOURCES</b>
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**Objective:** to identify what diffuse source methods are available and to determine what factors inhibit the adaptability and use of these methods in other countries

Presentations

*Discussion points:*

- What types of methods do Member countries use to estimate emissions from diffuse sources?
- In which sectors have methods already been developed? (e.g. transport, household, small and medium-sized enterprises, etc.)
- What types of data and information are needed to estimate releases from diffuse sources by sector?
- What key factors affect the reliability and accuracy of the techniques?
- What can be done to improve accuracy and reliability?
- Are these methods transferable between countries?

10H30-11H00      Break

**12H30-14H00**      **Lunch**

<b>Afternoon Session - Thursday, 16 December, 1999</b>
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14H00-15H30	SESSION V	Communication of release estimation techniques to reporters
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**Objective:** To identify possible approaches for communicating estimation techniques for point sources to reporters.

Presentations

*Discussion points*

- How can estimation techniques be communicated to those industries that generate and report data (e.g. format, presentation, medium, target groups, etc.)?
- What can be done to help prepare for reporting and what type of reporting mechanisms can be used?
- What have Member governments and industry done to communicate methods to reporters (e.g., Australian industry handbooks, Internet, training, etc.).

15H30-16H00      Break

**Objective:** To examine how risk assessors can use PRTR data.

Presentations

*Discussion points:*

- What techniques (e.g. use of generic emission scenarios, default emission factors) do exposure/risk assessors use when conducting environmental exposure/risk assessments?
- What types of data do these assessors have and what types of data do they need?
- How can exposure/risk assessors use the data generated by a PRTR?

**18H00 Close of Session VI**

### Morning Session – Friday, 17 December, 1999

#### 9H30-12H00 SESSION VII HOW CAN THE SHARING OF ESTIMATION TECHNIQUES BE IMPROVED?

Summary of sessions - presentations by rapporteurs

*Discussion points:*

- Are there gaps in methods for specific activities, processes or chemicals? Is there a need to update or modify specific methods due to changes in technology or other factors?
- Is there a need for keeping the compendium of the release estimation methods updated? Should a web site be created to do this?
- Is it desirable to organise a “harmonised” core set of auxiliary information to be accompanied with release methods in terms of quality assurance?
- Would it be feasible to set up generic emission scenarios on specific use/industry categories for the purpose of PRTRs and to develop OECD-wide guidance documents on estimation methods based on them?

*Emission factors:*

- Is there a need for developing a compendium on emission factors (e.g. default emission factors, process-specific emission factors) at an international level?
- Is it feasible and useful to set up default emission factors for the cases in which no other methods are applicable?

*International level:*

- Is there a need to develop guidance that describes release estimation methods of specific chemicals?

10H45-11H15 Break

**12H30-13h30 Lunch**

### Afternoon Session - Friday, 17 December, 1999

13h30-15h30 SESSION VIII

Next steps and recommendations

**Objective:** To develop recommendations for the OECD and determine possible next steps.

*Discussion points:*

- What are the barriers to sharing techniques between countries?
- What should be done to improve the sharing of techniques?
- Could countries select a sector and improve or develop basic features adaptable to most countries

14H00-14H30 Break

**16H30 Close of workshop**



**ANNEX 2**

**Outline summaries prepared at the workshop by session reporters**



## **SESSION III ESTIMATING EMISSIONS FROM POINT SOURCES**

**Summary Outline prepared by  
Rory Sullivan, Pacific Air and Environment, Australia**

### **Evaluation**

There is a need for the critical evaluation of various emission estimation techniques, their strengths and weaknesses and the merits of each. This will need to recognise that all countries are at different stages of development and that most countries will start with basic emission factors for their PRTRs. This need is not met by the 'compendium' document prepared for the workshop.

### **Criteria**

- There is a need for developing criteria for evaluating emission factors for transfer from one country to another.

### **Transparency**

- Encouraging member countries to make all supporting data (e.g. used in emission factor development) available. In particular,
  - Facility type (s)
  - Pollution controls
  - Operating conditions
  - Regulatory conditions
  - Fuel type/composition
  - Raw material type/composition

### **International Consistency**

- Identifying emission factors that are regarded as acceptable for different countries (e.g. USEPA 'A' related data, etc.)

### **Definitions - technical**

- Try and use standard definitions for substances e.g. VOCs, PAHs and for industrial use categories.

### **General**

- Ensure that OECD links country homepages /other sources of emissions data.
- Encourage PRTR development to look beyond PRTR databases to broader sources of information e.g., life cycle analysis, risk assessment.

- As a start, this could be done by providing links/contacts for good sources (maybe Internet addresses).
- There is a hierarchical order to when estimation techniques should be applied. It depends on variables such as facility size, process and goals of a PRTR system.
- Improving the communication between countries to enhance the exchange of techniques and pertinent information was of key importance to participants at this workshop. Finding ways at the international level to extend the knowledge base on estimation techniques and to increase the sharing of information is can provide valuable benefits to countries.

## SESSION IV

### ESTIMATING RELEASES FROM DIFFUSE SOURCES

#### Summary Outline prepared by

Rhonda Boyle, Victoria EPA, Australia

#### Key points

- Releases from diffuse sources are important in virtually all countries although not part of all PRTRs. They
  - provide context for point source emissions;
  - often major contributor to total emissions; and
  - important part of environmental management by government e.g. reduction targets, use by industry groups.
- The importance of a diffuse source activity (and in terms of whether releases should be included in the PRTR) should be prioritised based on relative significance of the amount and type of pollutants released from the particular activity..
- Speciation data needed in addition to emission factors. However, as noted in discussions, speciation data sources are very limited.
- Some PRTRs use Geographical Information Systems (GIS) to input and display diffuse source data

#### Main Recommendation

- Develop compendium that summarises different approaches to the estimation of emissions from diffuse sources:
  - by source and pollutant.
  - links/references to other detailed information e.g. AP 42, Australian NPI website.
  - suggest appropriate method according to different levels of data available.
  - to the extent possible, include comments on reliability of data and those factors that influence reliability.
  - it is important that the document is kept up to date and is prepared in a timely manner.
  - bottom up versus top-down approach.

## **SESSION V**

### **COMMUNICATION OF RELEASE ESTIMATION TECHNIQUES TO REPORTERS**

**Summary outline prepared by  
Kathryn Kelly, Environment Australia**

#### **GOALS**

- RAISE AWARENESS OF THE PROGRAM AND REPORTING REQUIREMENTS
- IMPROVE ACCURACY OF THE DATA
- REDUCE BURDEN ON INDUSTRY AND GOVERNMENT BY PROVIDING ASSISTANCE TO REPORTERS

#### **CONTEXT**

- THE NATIONAL REQUIREMENTS OR CHARACTERISTICS OF PROGRAMS, FOR EXAMPLE, LEGISLATION, RESOURCES AVAILABLE, WILL DETERMINE TYPE AND AMOUNT OF ASSISTANCE PROVIDED.

#### **ASSISTANCE**

- GUIDANCE DOCUMENTS
- TRAINING/INFORMATION TOOLS
- ELECTRONIC REPORTING TOOLS/PAPER FORMS
- ELECTRONIC ESTIMATION TOOLS
- QUESTION AND ANSWER WEB SITES/PAPERS

#### **ISSUES**

- STAFF TURNOVER IN INDUSTRY AND GOVERNMENT
- THERE NEEDS TO BE TRANSPARENCY OF ESTIMATION METHODOLOGIES, FOR EXAMPLE, IN ELECTRONIC REPORTING OR ESTIMATING TOOLS
- COSTS OF DEVELOPMENT OF GUIDANCE DOCUMENTS
- DETAILS OF PROGRAMS (CHARACTERISTICS AND ASPECTS)
- FEEDBACK IS NECESSARY
- SMALL AND MEDIUM SIZE ENTREPRISES NEED MORE TAILORED ASSISTANCE AND GUIDANCE.
- BETTER COMMUNICATION CAN PRODUCE BETTER REPORTING AND DATA. BUT THE NATURE OF THE GUIDANCE WILL VARY DEPENDING ON HISTORY, RESOURCES, and PROGRAMME DESIGN.

## **COMMUNICATION TOOLS**

### **1. GUIDANCE DOCUMENTS**

- Guidance documents - Not all countries develop guidance documents. They are developed in different forms. The US TRI develops some on an industry basis, some on a process basis and some on a substance specific basis. Australia develops them on both industry and process bases.
- Important to develop documents with industry involvement
- Important that they are not too complex and 'overwhelming' for their audience.
- Shortcomings - Time constraints meant manuals were not tested with industry.
- Handbook distribution – identify possible reporters through licences, phone books, industry organisations, other agency databases.

### **2. TRAINING OR INFORMATION TOOLS**

- Seminars
- Site visits
- Meetings with industry organisations.
- Training of government staff
- Institutionalise program requirements to counteract impacts of staff turnover, both in industry and government.

### **3. ELECTRONIC REPORTING TOOLS/PAPER FORMS**

- Necessary to reduce workload
- Some companies still don't have computers, so paper records required.
- Some programs require paper records to be held.

### **4. ELECTRONIC ESTIMATION TOOLS**

- Must be transparent in relation to estimation techniques
- Must be easy to use – for example, units clear.

### **5. QUESTION AND ANSWER WEB SITES/PAPERS OR HOTLINES**

- Useful for providing quick answers to common questions.

## SESSION VI

### PRTR DATA AND EXPOSURE ASSESSMENT (EA)

**Summary Outline prepared by  
Paul van der Poel, RIVM, the Netherlands**

#### **KEY POINTS**

1. PRTR data may be used directly for site-specific exposure assessment, and in the process of creating Emission Scenario Documents (ESDs).
  - There is a link between the work on ESDs and that be conducted under the PRTR Emission Estimation Techniques (EETs) project.
  - Guidance documents (and eventually integrated guidebooks) on EETs should be developed.
  - The work on EETs should be led and guided by an informal Task Force of PRTRs and EEA specialists.
  - Investigation on the possibility of a combined development of ESDs and Guidance Documents should be carried out (saving time, money and effort, and encouraging a uniform approach etc.).
  - The burden of the development of documents may be shared using the lead country approach.
2. Emission factors already established in the various countries for PRTR and EA may be shared in an easily accessible database on the Internet.
3. Harmonisation of categories of (industrial) activities between PRTR and EA is necessary.
4. Additional data sources and relevant information for the work on EETs (and ESDs) should be identified.
5. PRTR data can be used as screening tool for determining when an exposure assessment is needed.
  - An issue with PRTR data is that it is estimated data collected annually and is more useful for long-term assessments in lieu of short-term (or acute) assessments.
  - PRTR data is a starting point and more data would be needed.
  - PRTR is a tool that can be used even with its limitations (e.g. limited set of chemicals covered)
6. Need a continued effort on burden sharing of member country work on risk assessment.

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ENV/JM/RD(2000)1

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