POLLUTANT RELEASE AND TRANSFER REGISTERS (PRTRs):

A Tool for Environmental Management and Sustainable Development

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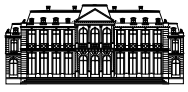

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Introduction

A PRTR is a tool which can augment government efforts to integrate environmental management and promote pollution prevention. The relative youth of PRTR systems means that uses and benefit for these programmes are still unfolding. While governments have traditionally enacted environmental policies in reaction to specific incidents or crises, PRTRs represent a new generation of environmental efforts for governments, industry and the public alike. All three groups can use PRTR results to identify potential environmental problems and take action before a critical situation occurs. With only a few years since the first PRTR began, the value of these systems are in an evolutionary phase. Industry, government and the public can use this information tool to improve efficiencies, monitor environmental policy and reduce waste. The cumulative result can be the sounder management of the environment.

What is a Pollutant Release and Transfer Register (PRTR)?

Agenda 21, from the United Nations Conference on Environment and Development (UNCED), Rio de Janeiro, 1992, lays out specific goals and objectives for countries to strive to meet for the 21st Century. As made clear in Chapter 19 of Agenda 21 an emissions inventory[1] is an approach government could take to collect data about pollutants while providing public access to the information to reduce risks from chemicals. Chapter 19 further states that the broadest possible awareness of chemical risks is a prerequisite for chemical safety. Agenda 21 also points out that industry should provide data for substances produced specifically for the assessment of potential risks to human health and the environment. These data should be made available to national authorities, international bodies and other interested parties involved in hazard and risk assessment, and to the public to the greatest extent possible, taking into account legitimate claims for confidentiality.

A PRTR is an environmental database or inventory of potentially harmful releases to air, water and soil as well as wastes transported to treatment and disposal sites. Facilities releasing one or more of the substances report periodically as to what was released, how much, and to which environmental media. Data are then made available to interested parties. In addition to reports from stationary sources, some PRTR versions include diffuse releases such as transport and agricultural releases which are estimated based on specific data and statistics.

A PRTR varies depending on a country's needs, conditions, environmental objectives and national priorities. All systems in operation today are based on different goals and objectives, therefore, the design and operation differs. There are, however, many commonalties between national PRTR systems. The common features of a PRTR are: a list of chemicals and/or pollutants, multi-media or integrated reporting of releases and transfers, data reported by source (for stationary sources), and the availability of data to the public.

What are the benefits?

Establishing a PRTR with clear goals and objectives can lead to a number of benefits. It is important to note that governments, the private sector and the public derive different benefits and uses from a PRTR system. Which benefits are realised depend strongly on the goals objectives, design and operation of each specific system.

This section identifies some of the many benefits, uses and advantages that can be obtained from a PRTR system. Given the national nature of a PRTR system, the weight of importance for each benefit can only be determined on a national basis. Hence, no priority order was given to the following list of benefits.

Government, industry and the public

- PRTR data enables governments to monitor progress on pollution or chemical reduction policy and indicate trends over time. These results can help identify the effectiveness of environmental policy and indicate where adjustments or new

[1] An "emissions inventory' is the term used in Agenda 21. However, the International Programme for Chemical Safety Consultation Group, tasked with follow-up to this subject, selected the term "pollutant release and transfer register" -- a more descriptive term -- to mean the same as an emission inventory or toxic emissions inventories.

policy needs to be made. In addition, PRTR data can be used to monitor progress towards targets and commitments to international environmental agreements and conventions.

- Results of a PRTR can help pin-point priority candidates to introduce technologies for cleaner production.

- Indicators for monitoring the environmental performance of industry and governments can be derived from PRTR results.

- A PRTR can provide data about accidental releases such as spills or emissions from a fire at an industrial facility. Register results can also be used to plan for possible emergencies by providing insight into the kinds of releases that could occur under emergency circumstances.

- In more and more countries where investment and financial capital could be tied to environmental performance, data from a PRTR could illustrate environmental performance of particular government and industry policies. In addition, PRTR data could supply useful information for land-use planning activities and in the licensing potential sources of pollutants.

- PRTR results can be used to help direct research and development for pollution prevention, recycling, recovery and re-use technologies. It can also indicate where technology transfer might be most useful.

Industry

- Collecting and reporting release and transfer data can assist firms to identify material loss which equates to waste -- or lost revenue. In turn, a PRTR can stimulate more efficient use of chemical substances, e.g. better use and/or recovery of materials and/or other feedstock for production. Increased efficiency means reduced releases and/or transfers over time, this directly relates to increased profits.

- With regard to industry standards, many companies have confirmed that a PRTR can provide a template for environmental reporting under ISO 14 000 and perhaps help to set the basic framework for integrated pollution reporting. The existence of a PRTR could spur reporting facilities to improve internal auditing activities and set corresponding performance measures Conversely, if industries implement auditing, monitoring and reporting systems in accordance with ISO 14 000, this will greatly facilitate their ability to collect and report PRTR work more cost-effectively.

- PRTR outputs can stimulate the private sector, especially small and medium-sized enterprises (SMEs), to develop leak detection programmes and install “good housekeeping” procedures. Alternatively, lists of reporting facilities enable technology providers to identify potential customers, i.e. supply and demand for cleaner technologies can be matched more rapidly and efficiently.

- A PRTR can compliment active industry programmes such as Responsible Care. PRTR data can provide a baseline and a method to track trends of pollutants that are deemed of priority concern. This information can be turned into performance indicator under the code of management practice on pollution prevention.

- Collection and collation of PRTR data provides a means for multi-facility operations to compare results among other facilities and within the sector or manufacturing group so as to identify data discrepancies and opportunities for cleaner production.

- A PRTR offers the private sector the opportunity to lead by example -- providing release and transfer information can change the public’s image and response. It allows for workers and the public to be informed about the pollutant releases and transfers in their local environment.

Public

- In terms of the benefits to the public, access and dissemination of PRTR data enables informed participation in environmental decision-making.

Often, unforeseen benefits are identified during the operation of a PRTR system. For example, certain aspects of the environmental status of a facility being offered for sale can be estimated from careful analysis of PRTR data; investors are increasingly using PRTR data when available to help them to learn more about the environmental behaviour

of a firm they are considering for investment. Under this scenario, facilities will thus become more fully aware of the financial penalty of not being environmentally responsible. Conversely, this could lead to efforts to reduce releases and transfers.

Many of the potential benefits cannot be readily converted into direct monetary or other tangible units such as avoiding adverse environmental or human health risks or promoting commercial activities in developing technologies for cleaner production and products, or to stimulating more efficient governmental policies to protect the environment. These actions are quite difficult to quantify, yet should be kept in mind as decisions are made as to whether or not a PRTR should be established.

It is important to bear in mind that benefits achieved through a PRTR system do, however, involve some costs. As might be expected, costs are higher at the onset the first reporting cycle when: (i) the reporting facilities that must identify what data to report; (ii) government needs to collect, collate, organise and disseminate data; and iii) the public learns how to access outputs of the PRTR system.

Experience of OECD Member countries with operating PRTR systems indicates that the primary costs to government and reporting firms are during the first and second reporting cycle. After this initial outlay, costs for collecting, reporting and collating the information drop considerably[2]. (During 1997, OECD will collect general information on the costs to industry to report under different PRTR schemes.)

How can a PRTR be used for environmental management and risk reduction?

Generally speaking, environmental policy should seek to protect humans and the environment from potential risks. This should be done in a cost-effective manner and provide all affected and interested parties the opportunity to participate in the selection of policy options. A register can be very effective in identifying areas of policy needs and in setting priorities for risk reduction by providing difficult to obtain information about the pollution burden. PRTR information can provide new insights to the distribution of pollutants of concern prompting more precise priority-setting and environmental decision-making by public sector bodies.

Over the past few years, OECD Environment Ministers have indicated the need for longer-term horizons for planning -- developing a better collective sense of where to be in 10, 20 or 50 years. Just as important as formulating a longer-term plan, is establishing a monitoring programme to indicate progress towards goals. A PRTR is an effective tool for indicating the performance and progress of specific environment policies and to identify particular achievements. To accomplish this, data about the releases of certain pollutants need to be drawn together to form a baseline. PRTR data collected over time can be aggregated and then assessed against the baseline. Results can be used to enhance the clarity and transparency of both the pollution situation and progress towards the targets or goals of government policy.

A PRTR can be a powerful tool for pollution prevention and chemical risk reduction. Governments and the private sector alike can use the release and transfer data to set policy and install mechanisms to encourage pollution prevention and the reduction of risks. PRTR data are often used in conjunction with other statistical information to support the identification and assessment of risks to humans and the environment in risk reduction models and other environmental models.

Developing a PRTR System

Guidance Manual for Governments

In 1993, OECD agreed to develop a Guidance Manual for Governments wishing to implement a PRTR system. The basic text for the Manual was developed through a series of workshops attended by representatives from governments, industry and non-government organisations. The Guidance Manual for Governments, which was published in February 1996, sets forth basic principles for developing a PRTR and presents options for implementing an effective system. The following section highlights key aspects of the manual.

[2] For more information on costs to governments refer to the publication by WWF entitled "The Right-to-Know: The Promise of Low-cost Public Inventories of Toxic Chemicals", 1995, USA.

Basic Principles

Fifteen basic principles underpin the establishment of an effective system. The significance of these principles for establishing a system surfaced during the development of OECD's Guidance Manual. Governments wishing to implement a PRTR need to review and address each principle individually. (N.B. These principles do not have a specific ranking or order.)

PRTR system design

- PRTR systems should cover an appropriate number of substances which may be potentially harmful to humans and/or the environment into which they are released or transferred.

- PRTR systems should involve both the public and private sectors as appropriate: a PRTR should include those facilities or activities which might release and/or transfer substance of interest and, if appropriate, diffuse sources.

- Both voluntary and mandatory reporting mechanisms for providing PRTR inputs should be considered with a view as to how best to meet national goals and objectives of the system.

- The comprehensiveness of any PRTR in helping to meet environmental policy goals should be taken into account, e.g. whether to include releases from diffuse sources ought to be determined by national conditions and the need for such data.

- Any PRTR system should undergo evaluations and have the flexibility to be altered by governments in response to these evaluations or to the changing needs of affected and interested parties.

- The entire process of establishing the PRTR system, its implementation and operation, should be transparent and objective.

- To reduce duplicative reporting, PRTR systems should be integrated to the degree practicable with existing information sources such as licenses or operating permits.

Environmental Management

- The PRTR data should be used to promote prevention of pollution at the source, e.g. by encouraging the implementation of cleaner technologies.

- National governments should use PRTR data to evaluate the progress of environmental policies and to assess to what extent national environmental goals are, or can be, achieved.

Affected and interested parties

- In devising a PRTR system, or when modifying existing systems, governments should consult with affected and interested parties to develop a set of goals and objectives for the system, identify potential benefits and estimate costs to reporters, government and society as a whole.

- The results of PRTR should be made accessible to all affected and interested parties on a timely and regular basis.

Risk

- PRTR systems should provide data to support the identification and assessment of possible risks to humans and the environment by indicating sources and amounts of potentially harmful releases and transfers to all environmental media.

Data handling and management

- The data handling and management capabilities of the systems should allow for verification of data entries and outputs and be capable of identifying geographical distribution of releases and transfers.

- PRTR systems should allow, insofar as possible, for comparison of information and co-operation with other national PRTR data systems and consideration for possible harmonisation with similar international data bases.

Compliance

- A compliance mechanism to best meet the needs of the goals and objectives should be agreed by affected and interested parities.

PRTR Design

Before embarking on the design of a system, it is important to review national policy objectives, then co-ordinate local and regional needs. As goals and objectives are developed, governments should ensure that the system can interact and be compared with other key data systems in operation (e.g. the geographic information system) which will help meet the primary objective of a PRTR.

How a PRTR system is designed will determine the benefits. As previously mentioned, it is a national system based on local conditions, needs and circumstances. However, there are key components to a PRTR that create an operating framework.

Box 1
PRTR Design: Key Aspects

1. Establish clear goals and objectives.
2. Consult with interested and affected parties (stakeholders).
3. Develop a manageable list of potentially hazardous pollutants or chemicals.
4. Define the scope the system. Who must report, to whom, how often, etc.
5. Define what will be reported, e.g. data from point and/or diffuse sources, name and co-ordinates of a facility, geographic descriptor of facility, latitude and longitude, etc.
6. Analyse existing reporting requirements to identify how they can be used to attain PRTR objectives.
7. Define how claims of confidential data will be handled.
8. Develop data verification method(s).
9. Define resource needs.
10. Develop a programme review system, i.e. facilitate updates and modifications to the system as it grows and advances.
11. Formulate an information dissemination strategy.

Data handling and management: a common set of elements

Through the preparation of the OECD PRTR Guidance Manual for Governments, a common set of data elements emerged which are central to the data handling and management function. These elements are the building blocks for a national system. They are of key importance for those governments seeking to someday have data that are comparable to other national systems (e.g. such as under NAFTA or the European Union). Of course, governments would naturally add elements as necessary to meet the goals and objectives of their own national PRTR programme. The common set of data elements are listed in Box 2.

Box 2
Common Set of Data Elements

1. Name and address of reporting facility (and mailing address if different).
2. Latitude and longitude of reporting facility.
3. Activity identifier, e.g. SIC or 4 digit ISIC code.
4. Chemical name and identifier: All countries with a PRTR use the C-A-S number.
5. In agreed units: the amount released, the amount transferred and the total amount released and transferred.
6. Period covered by the report.
7. Data claimed as confidential. For data claimed confidential, generic data should be used in its stead.

The Case of Small and Medium-Sized Enterprises

Frequently, small and medium-sized enterprises (SMEs) make up 80-90% of all industrial establishments in a country. For example, in the European Union, over 90% of all firms have under 50 employees. Many SME operations are releasing large amounts of potentially hazardous pollutants into the environment with their daily operations. However, more often than not, it is the SME which lacks access to finance, technological or managerial know-how. Collecting PRTR data from SME operations is particularly important if a goal of the system is to obtain a true national profile of pollutants of concern.

Countries with operating PRTR systems have developed various methods to handle SMEs at different levels. For example, Canada and the United States both have a reporting threshold based on the size of the company: Firms with ten full-time employees or more must report PRTR data. The UK requires SMEs to report if they fall into a specific process or production category. Noting the special needs of SMEs, some countries have created unique reporting forms to include, for example, only a sub-set of the data elements required to be reported.

The use of thresholds provide governments with a mechanism to define who reports. In practice, thresholds would be the trigger for determining individual reporters. Thresholds can be set by the number of employees, turnover (sales per unit time), inputs to the facility (amounts processed), amounts manufactured, etc. In setting threshold limits, governments should bear in mind the need to balance the benefits of receiving a report from a SME with the costs to reporters and the authorities. However, if decisions are taken by PRTR designers to limit the number of SME reporters, estimates of release from SMEs should be encouraged.

PRTR Systems in Operations

Most countries of the OECD have established, are developing, or plan to develop a PRTR system.[3] As mentioned earlier, each PRTR system is developed according to national (and sometimes regional and local) goals and objectives. No two systems are the same even though many features are similar. As an example, key features of PRTR systems from Canada, the Netherlands, the United Kingdom, and the United States are summarised.

Canada

In the 1990 "Green Plan", the Canadian government committed to developing a national database for hazardous pollutants being released from industrial and transportation sources. A Multi-stakeholder Advisory Committee representing industry, labour, non-governmental organisations federal and provincial governments developed a National Pollutant Release Inventory (NPRI) which became operation in 1993. This inventory, which is similar in structure to the U.S. TRI, is intended to serve as a tool for identifying potential environmental problems and for encouraging voluntary

[3] In September 1996, the European Union approved an amendment to the Integrated Pollution Control Directive requiring all Member States to implement a "Pollutant Emission Register".

reductions of potentially hazardous pollutants. The NPRI is designed to enhance the harmonisation of pollution reporting requirements across all levels of government for all environmental media.

The inventory list currently includes 178 substances for which facilities are required to submit release and transfer data each year to Environment Canada. Environment Canada encourages reporting facilities to submit data electronically.

Thresholds for reporting are facilities with more than ten full-time employees and which manufacture, process or use any of the listed substances in quantities greater than ten tonnes per year. No specific industrial sector is required to report, however, some activities such as mining, retail sales and agriculture are exempt.

Data collected by the NPRI are collated into an annual report, co-ordinating data under specific themes and topics. The report and actual raw data are available electronically through Internet.

The Netherlands

Since 1974, the Netherlands has operated a voluntary emissions inventory covering releases to air and soil. In the near future, transfers of wastes will be added and reporting will become mandatory for a large point sources. In addition, data collected form these facilities will be made accessible to the public. Currently, under the voluntary system, about 900 chemical releases are reported. When new legislation comes into force, data for about 250 pollutants, including waste transfers, will required to be reported annually.

The aim of the Emissions Inventory System (EIS) is to test the effectiveness of governmental environment policies and provide national and international bodies with official data on pollutants released in the Netherlands. The recently implemented annual reporting enables the government to better analyse trends
of emissions data and verify progress towards environmental targets.

The EIS is composed of two separate inventory systems: the Individual Emissions System and the Collective Emission Inventory System. It contains data from individual facilities as well as from diffuse sources such as traffic, airports, households, etc.

Under the Individual Emissions Inventory, industrial emissions are supplied by industry over designated time periods or cycles. Based on data received, the government and specific industrial branches enter into a voluntary emission reduction covenant for priority chemicals. Progress on emission reductions are controlled by monitoring emissions. Over 800 companies (for over 2 000 facilities) report on about 900 pollutants.

Through the Collective Emission Inventory System, the government collects existing monitoring data or emissions estimates for smaller industrial and non-industrial activities. Data from diffuse sources and small and medium-sized enterprises are estimated by applying specific emission factors to statistical data (e.g. number of vehicles, vehicle movements, hectares of agriculture land, number of inhabitants, etc.). This system is linked to a geographical information system enabling a spatial presentation of pollution data. The geographical data is then used as input in dispersion models to calculated ambient concentrations.

United Kingdom

The Chemical Release Inventory (CRI) falls under the purview of the Environmental Protection Act of 1990. It is linked to the Integrated Pollution Control (IPC) regulatory scheme via operator authorisations for specific processes. Operators with licenses must report releases of pollutants controlled through the authorisation.

The main purpose of the CRI is to fulfil the UK government's commitment to make environmental information widely available to the public. Specifically, it is intended to promote a clearer picture of the scale and nature of releases from the major industrial sources of pollution which are covered by the IPC regime. A second objective of the system is to contribute to a database of inputs of pollutants into the environment. This is particularly important where ambient levels are high. The information facilitates more informed analysis of the sources of pollution, environmental effects and trends. This, in turn, enables authorities to identify priorities for action.

The linkage of the CRI to operating licenses is seen to provide an important advantage in terms of reporting and accuracy of information. Since, the CRI data is derived from the information industry is required to report according to

their authorisation license, no additional reporting requirements or costs are imposed. Currently, there are no thresholds for reporting in that all facilities holding an operating license must report release data.

The CRI includes air and soil release data on 361 chemicals and 125 isotopes (regulated under the Radioactive Substances Act of 1993). Data of actual quantities of substances release are due annually. Some data requirements necessitate continuous discharge monitoring and some data are estimated.

Discussions concerning the modification of the current CRI system are underway. The Environment Agency is presently reviewing options and expect to soon release a new plan.

The 1994 CRI data is available on Internet. The UK government develops a summary report of data organised in different categories and themes.

United States

In 1986, the United States Congress enacted a law entitled the Emergency Planning and Community Right-to-Know Act (EPCRA). This law required industrial facilities to provide publicly available reports on the presence, releases and transfers of potentially hazardous or toxic chemicals. Several international and national incidents at industrial facilities had raised concern that the public lacked sufficient knowledge about the chemicals in their communities. The Toxics Release Inventory (TRI) was created by EPCRA to encourage greater participation by communities in environmental matters, and to foster increased dialogue and cooperation between the public and the local industrial facilities.

TRI is fully multi-media, collecting information on releases to air, water, land, underground injection, and transfers off-site for treatment, disposal, recycling, and energy recovery. As a result of the Pollution Prevention Act of 1990, the TRI report also requires facilities to provide information on the waste management practices for each chemical or chemical category.

The list of chemicals and chemical categories reportable to TRI number is over 600. The industrial sectors which must report include a broad range of facilities, from manufacturers to coal and metal mining facilities to electric generating facilities. To provide regulatory relief, EPCRA requires a facility to report for a chemical or chemical category if the facility uses the substance at certain amounts (25,000 pounds for manufacturing or processing, 10,000 pounds for otherwise use). Facilities with fewer than 10 employees also are exempt from reporting. EPA receives approximately 80,000 reports from about 25,000 facilities every year.

The Environmental Protection Agency (EPA) makes each year's TRI data available to the public through a variety of means. A document which analyses the TRI data by state, industry, chemical and year is published annually. TRI data is available on Internet and CD ROMs.

OECD Activities

The vast utility of a PRTR system prompted OECD Environment to Ministers endorse, and the OECD Council to approve, a Council Recommendation on "Implementing Pollutant Release and Transfer Registers" (C(96)41/FINAL). The recommendation calls for Member countries "to take steps to establish, as appropriate, implement and make publicly available a pollutant release and transfer register (PRTR) using as a basis the principles and information set forth in the OECD Guidance to Governments Manual for PRTRs." Progress by OECD countries, with regard to the recommendation, will be reviewed in 1998.

Interest in PRTRs is increasing world-wide. The strong interest in PRTRs prompted OECD to embark on an outreach programme to help put the Guidance Manual into practice and introduce the concept and benefits of a PRTR to non-OECD countries. To accomplish this, the OECD, in conjunction with UNITAR, held 2 regional PRTR workshops for countries in key economic regions. The first workshop took place in Canberra, Australia in June 1996. Representatives from government, industry and non-governmental organisations participated in the workshop. The second outreach workshop will take place in Prague, January 1997. It was attended by over 100 participants from government, industry, experts and non-governmental organisations from governments of Central and Eastern Europe and the New Independent States of the Former Soviet Union.

Future Work by OECD

OECD is currently conducting a study of reporting firms: (i) to determine the environmental effectiveness of PRTR systems in operation; (ii) to identify the costs of reporting under different PRTR regimes; and (iii) to analyse the role of a PRTR within the context of a environmental management system, or under ISO 14 000. The first phase of the study will take place in 1997. The method for this study is by on-site interviews with PRTR reporters under four different national PRTR schemes: Canada, the Netherlands, the United States and the United Kingdom.

In 1998, OECD will survey Member countries to identify progress of Member countries in implementing PRTR systems in accordance with the OECD Council Recommendation on Implementing PRTRs. Information concerning goals, design and operation of each national PRTR will be included in the report. Also in 1998, OECD will hold an International PRTR Conference inviting representatives from governments, industry, NGOs, academia and experts from around the world. The conference, which is kindly hosted by the Government of Japan, will take place 8-11 September, 1998 in Tokyo. The preliminary results of the 1997 study will be one topic for the conference. Other conference topics could include: data confidentiality, dissemination PRTR results, estimation of data, reporting data, diffuse source estimations, uses of PRTR data, data base system design, implications on competition, etc.

Summary

Efficient environmental policy requires sufficient knowledge about pollutants. Having only some of the necessary information can leave government ill-prepared to establish clear and competent programmes. In order to set and operate environmental policies in the future, governments must know the current state of their national environment and have a consistent and valid means to measure changes to the environment. Then, to fully understand pollutant impacts, data are needed concerning the identities of pollutants, the amounts released or transferred, the potential risks involved, and the sources of these substances — in particular the exact locations of these sources. A pollutant release and transfer register is an information system which meet these criteria by providing key information about the state of the environment. As such, it can be a vital tool for sound management of the environment.

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