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THE WORKING PARTY ON CHEMICALS, PESTICIDES AND BIOTECHNOLOGY**

Guidance Document on Elements of a PRTR: Part II

**Series on Pollutant Release and Transfer Registers
No. 18**

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OECD Environment, Health and Safety Publications

Series on Pollutant and Transfer Registers

No.18

**REPORT OF THE WORKSHOP ON A FRAMEWORK FOR THE DEVELOPMENT AND USE
OF INTEGRATED APPROACHES TO TESTING AND ASSESSMENT**

IOMC

INTER-ORGANIZATION PROGRAMME FOR THE SOUND MANAGEMENT OF CHEMICALS

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Environment Directorate
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Paris 2015

Pollutant Release and Transfer Registers (PRTRs): A Tool for Environmental Policy and Sustainable Development. Guidance Manual for Governments (OECD/GD(96)32) (1996).

PRTR Series

No. 1: Proceedings of the OECD International Conference on Pollutant Release and Transfer Registers (PRTRs). PRTRs: National and Global Responsibility. Tokyo, 9-11 September 1998. Part 1 (1999).

No. 2: Proceedings of the OECD International Conference on Pollutant Release and Transfer Registers (PRTRs). PRTRs: National and Global Responsibility. Tokyo, 9-11 September 1998. Part 2 (1999).

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FOREWORD

A Pollutant Release and Transfer Register (PRTR) brings information about which chemicals are being released or otherwise managed as waste, where, how much and by whom. Since 1996 when the OECD started to encourage the development of PRTRs via the adoption of the OECD Council Recommendation on Implementing PRTRs [C(96)41/FINAL (amended C(2003)87)] and began developing guidance materials to assist countries to set up PRTRs, the number of OECD countries with operating PRTRs has dramatically increased. Many non-OECD countries, particularly in Asia and South America, are expected to implement a PRTR in the coming years.

Most PRTRs were designed to meet the needs of a specific country, with less attention being given to the comparability of the data across different PRTRs. Consequently, many PRTRs have differing requirements in terms of which chemicals and sectors are covered, and what thresholds trigger reporting. In 2009, the 12th meeting of the OECD Task Force on Pollutant Release and Transfer Registers (TF-PRTRs) noted that while there are 1,200 chemicals in the PRTR Data Centre, only 14 of them are common to all PRTRs. The TF-PRTRs agreed to produce a more harmonised list of chemicals than is available at present and thereby improve the comparability of PRTR data on a global scale.

The TF-PRTRs then initiated exploring key elements of a PRTR to national governments that are designing new PRTRs or considering revising an existing PRTR. This activity produces two guidance documents, Part I and Part II. A Part I document provides the elements that may be included in the design of a PRTR, while this document, a Part II, focuses on PRTR initiation, operation, and long term success.

Greater harmonisation of PRTR data across OECD countries – as well as many non-OECD countries which are using OECD guidance to establish their own systems – would provide increased opportunities for a global analysis of pollutant releases as well as facilitate comparisons between countries. Countries are encouraged to implement the OECD's harmonisation strategies and tools to realize the benefits from harmonised PRTRs as they set up or update their own PRTRs.

This document is published under the responsibility of the Joint Meeting of the Chemicals Committee and the Working Party on Chemicals, Pesticides and Biotechnology of the OECD.

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ABBREVIATIONS

API	Application Programming Interface
CAS Number	Chemical Abstracts Service Registry Number
CEC	Commission for Environmental Cooperation of North America
E.U.	European Union
EDI	Electronic Data Interchange
E-PRTR	European Pollutant Release and Transfer Register
GEF	Global Environment Facility
GIS	Geographic Information Systems
IOMC	Inter-Organization Programme for the Sound Management of Chemicals
NGO	Non-governmental Organization
NPI	National Pollutant Inventory
NPRI	National Pollutant Release Inventory
OECD	Organisation for Economic Co-operation and Development
PRTR	Pollutant Release and Transfer Register
RET	Release Estimation Technique
SAICM	Strategic Approach to International Chemicals Management
SIDS	Small Island Developing States
TRI	Toxics Release Inventory
U.S. EPA	United States Environmental Protection Agency
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNITAR	United Nations Institute for Training and Research

EXECUTIVE SUMMARY

In recent years, growing recognition of the need to evaluate environmental management and sustainable development on a global scale has emerged. When pollutant release and transfer register (PRTR) programmes gather data that are consistent with other PRTRs in definition and scope (harmonised data), information from multiple PRTRs can be harmonised and applied to meet this need.

This guidance document provides information on elements of a PRTR to national governments that are designing new PRTRs or considering revising an existing PRTR. It also provides factors that should be considered for users of multiple PRTR datasets and users who examine different PRTR data. It discusses elements of a PRTR relevant to PRTR initiation, operation, and long-term success, including:

1. PRTR Initiation

- Organizing support from legislative bodies, industry and the public
- Identifying the goals for the PRTR system
- Performing an infrastructure assessment
- Designing a PRTR
- Implementing a PRTR pilot
- Developing a PRTR proposal
- Providing reporting assistance for regulated entities
- Obtaining international support

2. PRTR Operation

- Staffing and governance
- Data collection, compilation and storage
- Data quality assurance
- Data dissemination

3. Long Term Success

- Compliance assurance

- Stakeholder outreach
- Enhancing the PRTR system over time

For each element, this document compares how existing PRTRs have been designed and implemented, presents recommendations from the OECD Council on Implementing PRTRs, and provides options for the design and implementation of new or revised PRTRs. Options provided consider two objectives for PRTRs: 1) meeting the needs of the country implementing the PRTR, and 2) collecting data that can be harmonised with data from other PRTRs. In addition, this document list useful resources for PRTR initiation, operation, and long-term success.

1. INTRODUCTION

1.1 Background

1. Pollutant release and transfer register (PRTR) systems typically require facility owners or operators to quantify and report on a given cycle the quantities of hazardous chemical substances and other pollutants they release into the environment or otherwise manage as waste. This information is then made publicly accessible. Within a country with a PRTR system, various stakeholders benefit from access to PRTR data, including the public, governmental agencies, regulated entities, non-governmental organizations (NGOs), researchers, news media, and academicians (UNECE, 2012c; U.S. EPA, 2013)..

2. In recent years, growing recognition of the need to evaluate environmental management and sustainable development on a global scale has emerged. When PRTR programmes gather data that are consistent with other PRTRs in definition and scope (harmonised data), information from multiple PRTRs can be harmonised and applied to meet this need. However, many of the currently existing PRTR systems were originally designed for a single country or region. As such, the data collected by each system has been shaped by factors specific to that country or region, and are often not harmonisable with data collected by other PRTRs. For example, the design of a national or regional PRTR might be influenced by national environmental policies, types and size of industrial sectors, priority environmental and human health concerns, experience with emissions inventories, available resources, planned end uses, and political needs.

3. The differences among PRTRs make it more difficult for policy makers to share experience in PRTR and application of PRTR data among different countries. For industry, particularly for international companies, the differences could add cost to comply with PRTRs reporting requirements in different countries. Although some variation among PRTRs may be necessary to ensure that PRTR systems meet their countries' needs (e.g. gathering information that complements their existing environmental programs), countries may consider collecting key data that are harmonisable with data collected by other PRTRs to enable integration of the data for global scale applications when designing new PRTR systems, or modifying existing ones.

4. In this document the terms “harmonise” and “harmonisation” means to make compatible, miscible or combinable. Similarly, the term “harmonised” means to be compatible, miscible, combinable, or combined (integrated).

1.2 Purpose

5. This document provides information on key elements of a PRTR to national governments that are designing new PRTRs or considering revising an existing PRTR and describes considerations for developing PRTR systems whose data are compatible and can be integrated with data from other PRTRs for global scale analysis. For each element, this document presents recommendations from the OECD Council on Implementing PRTRs, and provides options for implementing a PRTR that 1) meets the needs of the country implementing the PRTR, and 2) collects data that are harmonised with data from existing PRTRs where possible.

6. This document is also useful for users of PRTR data, particularly those who use PRTR data from different PRTRs. Those who plan to examine different PRTR data can consider the points raised in this document.

1.3 Structure

7. The document has been developed in two parts: Part I and Part II. Part I of the document discusses elements that may be included in the design of a PRTR, and was recently published by OECD (2014a). Part II, the present document, focuses on PRTR initiation, operation, and long term success, and is organized into three sections:

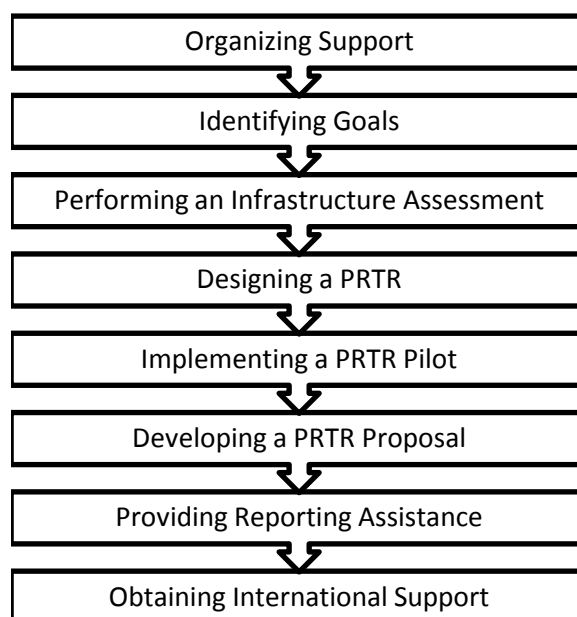
- **PRTR Initiation**, which covers organizing support from legislative bodies, industry, and the public; identify the goals for the PRTR system; infrastructure assessment; designing a PRTR; implementing a PRTR pilot; developing a PRTR proposal; providing reporting assistance for regulated entities; and obtaining international support.
- **PRTR Operation**, which covers staffing and governance; data collection, compilation, and storage; data quality assurance; and data dissemination.
- **Long Term Success**, which covers compliance assurance; stakeholder outreach; and enhancing the PRTR system over time.

2 PRTR INITIATION

2.1 Introduction

8. This section describes the steps a country can take to initiate a PRTR. These steps include:
- organizing support from stakeholders including legislative bodies, industry, and the public.
 - identifying goals for the PRTR to inform its design and implementation.
 - performing an infrastructure assessment to identify available and needed infrastructure for developing a PRTR.
 - designing each aspect of a PRTR system
 - implementing a PRTR pilot to test the design of a PRTR at a small scale
 - developing a PRTR proposal to document all specifications for a PRTR system
 - providing reporting assistance to help facilities understand the process and for gathering data and reporting to the PRTR
 - obtaining international support for initiating and implementing a PRTR, including support through bilateral cooperation and support from international organizations.

Figure 1. Steps to Initiate a PRTR



2.2 Organizing Support from Legislative Bodies, Industry, and the Public

9. The OECD Council on Implementing PRTRs recommends that countries take into account the principle that the entire process of establishing the PRTR system and its implementation and operation should be transparent and objective (OECD, 2003a). To promote transparency and gain support from stakeholders, it is recommended that a country:

- Conduct consultations with stakeholders to increase awareness about the PRTR through briefing documents, meetings, and workshops (UNITAR and IOMC, 1997a).
- Establish a “National Coordinating Team” with representatives from various stakeholder groups (e.g. governmental ministries, industry, non-governmental organizations, community representatives) to give stakeholders an active role in designing and establishing the PRTR (UNITAR and IOMC, 1997a).
- Communicate with stakeholders to understand and address their concerns. One way a country may respond to stakeholder concerns is by providing information on results and lessons learned under existing PRTRs (UNITAR and IOMC, 1998a).

2.3 Identifying the Goals

2.3.1 Principles

10. The OECD Council on Implementing PRTRs established 14 universal principles for establishing PRTR systems (OECD, 2003a). These principles, listed below, serve as the foundation of any PRTR system:

1. PRTR systems should provide data to support the identification and assessment of possible risks to humans and the environment by identifying sources and amounts of potentially harmful releases and transfers to all environmental media.
2. The PRTR data should be used to promote prevention of pollution at source, e.g. by encouraging implementation of cleaner technologies. National governments might use PRTR data to evaluate the progress of environmental policies and to assess to what extent national environmental goals are or can be achieved.
3. In devising PRTR systems, governments should Co-operate with affected and interested parties to develop a set of goals and objectives for the system and estimate potential benefits and costs to reporters, government and society as a whole.
4. PRTR systems should include coverage of an appropriate number of substances which may be potentially harmful to humans and/or the environment which are released and or transferred.
5. PRTR systems should involve both the public and private sectors as appropriate and include those facilities which might release and/or transfer substances of interest, as well as diffuse sources, if appropriate.
6. To reduce duplicative reporting, PRTR systems should be integrated to the degree practicable with existing information sources such as licenses or operating permits.
7. Both voluntary and mandatory reporting mechanisms for providing PRTR inputs should be considered with a view as to how best to meet the goals and objectives of the system.
8. 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.
9. The results of a PRTR should be made accessible to all affected and interested parties on a timely and regular basis.
10. Any PRTR system should allow for mid-course evaluation and have the flexibility to be altered by affected and interested parties in response to changing needs.
11. The data handling and management capabilities of the system should allow for verification of inputs and outputs and be capable of identifying geographical distribution of releases and transfers.
12. PRTR systems should allow as far as possible comparison and Co-operation with other national PRTR systems and possible harmonization harmonisation with similar international data bases.
13. A compliance mechanism to best meet the needs of the goals and objectives should be agreed by affected and interested parties.
14. The entire process of establishing the PRTR system and its implementation and operation should be transparent and objective.

11. Under Principle 3, the OECD Council on Implementing PRTRs recommends that countries take into account that when devising a PRTR system, governments should cooperate with affected and interested parties to develop a set of goals and objectives for the system (OECD, 2003a). While some of the goals of a specific PRTR may be unique to the PRTR, all PRTRs should share common goals that are consistent with the principles listed above. For example, goals for any PRTR may include:

- Acknowledging public right-to-know by facilitating access to information on pollutant release and transfers (OECD, 1996; UNITAR and IOMC, 1997a);
- Broadening of public participation and interest in environmental policy decision-making processes (OECD, 1996; UNITAR and IOMC, 1997a);
- Disseminating information concerning potential risks in local, regional or national contexts (OECD, 1996);
- Identifying opportunities for environmental risk reduction (UNITAR and IOMC, 1997a);
- Identifying geographic areas of environmental concern (UNITAR and IOMC, 1997a);
- Identifying key environmental burdens (OECD, 1996);
- Identifying sources of releases and transfers of pollutants (OECD, 1996; UNITAR and IOMC, 1997a);
- Tracking of substance specific emissions trends (UNITAR and IOMC, 1997a);
- Quantifying pollutant releases and transfers at the national and local levels (UNITAR and IOMC, 1997a);
- Reducing risks from pollutant releases and transfers to humans and/or the environment while ensuring that sources of pollutant releases are identifiable and accountable (OECD, 1996);
- Reducing specific environmental burdens (e.g. greenhouse gases, ozone depleters) which have a global impact (OECD, 1996);
- Obtaining data to fulfilling international obligations to report emissions data and statistics in a periodic and consistent fashion and (OECD, 1996; UNITAR and IOMC, 1997a);
- Promoting pollution prevention and control efforts and the use of cleaner technologies (OECD, 1996; UNITAR and IOMC, 1997a);
- Encouraging and monitoring product stewardship by importers, fabricators, and distributors (OECD, 1996);
- Encouraging the incorporation of a pollution prevention ethic within industry as companies realise the economic benefits of reducing the generation of releases and transfers (OECD, 1996);

- Minimising the impact of future environmental liability (OECD, 1996); and
- Integrating and harmonising reporting requirements (OECD, 1996; UNITAR and IOMC, 1997a).

2.3.2 National Goals

12. Goals for a PRTR system should include as a minimum those intended to meet national needs or objectives. Specific goals should be established and agreed upon prior to designing a PRTR; the goals can be used to inform design decisions regarding the PRTR's purpose and scope (OECD, 1996). To identify specific national goals for a given PRTR, it may be useful to consider (UNITAR and IOMC, 1997a):

- The potential benefits of the national PRTR for government, industry, and the public;
- Objectives that PRTR systems have served in other countries that are relevant for the country
- How the system could advance national environmental management goals.

2.3.3 Harmonisation Goals

13. The OECD Council on Implementing PRTRs (OECD, 2003a) recommends that countries take into account the principle that PRTR systems should allow as far as possible comparison and co-operation with other national PRTR systems and possible harmonisation with similar international data bases (Principle 12, above). To guide design of a PRTR so that it is harmonised with other PRTRs, a country may set harmonisation goals. For example, harmonisation goals might include:

- Obtaining data relevant to international environmental issues;
- Providing data suitable for use in international scale analyses (e.g. designing the PRTR such that its chemical and sector coverage and reporting requirements are similar to or overlap with those of other PRTR systems);
- Promoting sustainability on a global scale;
- Working with other countries' PRTR programs to gain insight from lessons learned, obtain solutions, or improve methodologies for the PRTR.

2.4 Performing an Infrastructure Assessment

14. To evaluate the current infrastructure relevant to designing and implementing a PRTR, a country can conduct surveys on topics including existing regulations concerning pollutant emissions and waste generation; current information flows for pollutant emissions data; industry activities related to emissions tracking, chemicals management, and emergency response; literature and study outputs that provide pertinent background information; and relevant stakeholders (e.g. environmental interest groups, research institutes and industrial associations) (UNITAR and IOMC, 1997a). A country can then compile this information in a "National PRTR Infrastructure Assessment Report" which summarizes legal, institutional, administrative and technical infrastructures relevant to designing a PRTR (UNITAR and IOMC, 1998b).

15. With this information, a PRTR can be designed that builds upon existing programs, initiatives and priorities within a country (UNITAR and IOMC, 1997a, 1997b). In addition, when a country has characterized its existing infrastructure, it is less likely to duplicate of existing efforts; this outcome is

consistent with Principle 6 (see Section 2.3.1) noted in the recommendation from the OECD Council on Implementing PRTRs that, to reduce duplicative reporting, PRTR systems should be integrated to the degree practicable with existing information sources such as licenses or operating permits (OECD, 2003a). For example, if facilities must already report annual air emissions to demonstrate compliance with operating permit emission limits, it may be possible to integrate annual reporting for a PRTR with reporting related to operating permits, so that facilities are only required to report their annual air emissions once annually to a single source from which the respective data are distributed accordingly.

2.5 Designing a PRTR

16. Design of a PRTR system is driven by the goals set for the system. For example, if a country has set as a primary goal to use PRTR data to evaluate the progress of environmental policies in the country, the PRTR should be designed to collect the information needed for policy analysis. In addition, if a goal is to provide data suitable for use in international scale analyses, a PRTR should be designed to collect information that is comparable or, ideally, miscible with that of other PRTRs.

17. Key features of a PRTR system include:

- **Reporting Universe** - What information will be collected by the PRTR? For example: reporting unit¹; reporting sectors²; chemicals coverage³; thresholds⁴; data elements⁵; and reporting period.⁶
- **Release Estimation Techniques (RETs)** - What techniques may be used to estimate PRTR data? How will the techniques be documented by reporting facilities?
- **Efficient System Development** - How will the costs of data collection be balanced with the value of data collected? How will sensitive information be protected?
- **Data Access and Analysis** - How will the data be made available to users, and in what forms with respect to its intended uses?

18. Detailed guidance on designing these key features of a PRTR, can be found in *Guidance Document on Elements of a PRTR: Part I* (OECD, 2014a).

2.6 Implementing a PRTR Pilot

19. A pilot can be conducted to test a PRTR prior to its full scale implementation. The primary purpose of the pilot is to determine if any problems in the planned PRTR exist and, if so where they exist, so that

¹ **Reporting unit** defines what types of entities must report to a PRTR (e.g. point sources).

² **Reporting sectors** identify which industrial sectors and activities are covered by a PRTR (e.g. manufacturing, electricity generation).

³ **Chemicals coverage** determines which chemicals and pollutants are covered by a PRTR

⁴ **Thresholds** determine the size of facilities that must report to a PRTR and which chemicals they report (e.g. a facility might be required to report a chemical if it released the chemical in quantities above the release threshold for that chemical).

⁵ **Data elements** determine the types of information that are reported to a PRTR (e.g. facility name, chemical name, release and transfer quantities, etc.)

⁶ **Reporting period** determines how frequently (e.g. annually) and for what time period (e.g. calendar year) facilities must report.

corrective actions can be taken prior to full-scale implementation. The lessons learned from the PRTR pilot phase are crucial to development of the PRTR proposal, the next phase in the establishment of a PRTR (discussed in section 2.6). To define the scope of a pilot, a country selects the subset of industries, chemicals, and local areas that will be included in the trial. At this time, a country may consult with potential reporters and other stakeholders to agree on objectives for the pilot and scope of information to be collected (OECD, 1996). A pilot then requires many of the same activities as implementing a full PRTR, but on a smaller scale. To implement a pilot, the country would provide reporting forms and guidance, train government staff, install hardware and software to collect and store PRTR data, conduct reporting workshops, and provide assistance to reporters (OECD, 1996; UNITAR and IOMC, 1997c).

20. A successful pilot can help a country to anticipate potential problems with the design and implementation of a PRTR and to refine the PRTR prior to implementation on a national scale (OECD, 1996; UNITAR and IOMC, 1997c). In addition, conducting a pilot may help a country to:

- Identify interested parties and raise awareness for the PRTR (OECD, 1996).
- Recognize the potential benefits and uses of a national PRTR system (OECD, 1996; UNITAR and IOMC, 1997c).
- Assess whether data collected will be useful for planned applications (UNITAR and IOMC, 1997c).
- Test the compatibility of PRTR data for use with data from other PRTR systems in international scale analysis (OECD, 1996).
- Understand resources required to implement the PRTR (OECD, 1996).

2.7 Developing a PRTR Proposal

21. A “National PRTR Proposal” articulates specifications for all aspects of a PRTR, including legal implications, technical design, institutional and administrative responsibilities, and national implementation of the PRTR system (UNITAR and IOMC, 1997d). The PRTR Proposal embodies the lessons learned from the PRTR Pilot, and includes adjustments and modifications that address the lessons learned. The proposal is a tool for communicating the design of the national PRTR system and for obtaining approval for a PRTR from national decision makers (UNITAR and IOMC, 1997d). UNITAR and the IOMC (1997d) recommend that a PRTR proposal be structured to include the following sections:

- Introduction;
- Objectives of the National PRTR System;
- Legal Implementation of the National PRTR System;
- Reporting Requirements and Procedures for Point Sources of Emissions;
- Treatment of Non-Point and Non-Reporting Point Sources of Emissions;
- PRTR Data Management System;
- Administration of the National PRTR System;

- National Implementation Work Plan;
- Review Procedures; and
- Recommendations for Further Development of the PRTR System.

22. To develop a PRTR that is harmonised with other PRTR systems, a country may consider including specifications relevant to harmonisation within the National PRTR Proposal. Examples of the types of specifications relevant to harmonisation that might be included within a National PRTR Proposal are presented in Table 1.

Table 1. Examples Specifications Relevant to Harmonisation that might be Included in a National PRTR Proposal

Section of National PRTR Proposal	Specifications Relevant to Harmonisation
Objectives of the national PRTR System	Harmonisation goals
Reporting requirements and procedures for point sources of emissions	Design decisions for collecting harmonised data for point sources
Treatment of non-point and non-reporting point sources of emissions	Design decisions for collecting harmonised data for non-point sources
Administration of the national PRTR system	Disseminating PRTR data for use in global scale analyses
Recommendations for further development of the PRTR system	Improving harmonisation of PRTR data through future enhancements to the PRTR

2.8 Providing Reporting Assistance for Regulated Entities

23. Providing reporting assistance to regulated entities helps facilities understand the process for gathering data and reporting to the PRTR. In addition, outreach that helps facilities reporting requirements can improve their ability to submit high quality data (OECD, 2008a).

2.8.1 Guidance Documents

24. One common form of outreach is the development and publication of guidance documents for PRTR reporting. Typical guidance documents include:

- **Reporting Forms and Instructions Documents:** Among other information, these documents communicate what information facilities are to report and how they report to the PRTR. This type of guidance document can include information on facilities that are required to report; the chemicals facilities must report; procedures for determining whether a facility meets reporting requirements (e.g. threshold determination); the data elements facilities must report; methods for estimating releases, transfers, and waste management; procedures for compiling and submitting data; and reporting deadlines.

- **Guidance Documents on Release Estimation Techniques (RETs):** These documents provide detailed methodologies facilities can use to estimate release, transfer, and other waste management quantities.
- **Focused Guidance Documents:** These documents deliver reporting guidance on a specific topic. For example, a guidance document may be prepared for a selected chemical or for a specific industry sector.

25. The most important guidance document for a country to develop is the reporting forms and instructions document; this type of guidance covers specific reporting requirements and procedures unique to the PRTR. A country should also consider developing its own guidance on RETs and focused topics.

26. A country may consider referring reporters to existing guidance documents (e.g. materials developed for other PRTRs, materials developed by IGOs to serve multiple PRTRs).⁷ Such guidances, however, are susceptible to becoming dated over time, as new information becomes available (e.g. improved emissions factors) or regulatory changes occur (e.g., lowering of an activity threshold quantity for reporting on the chemical). Thus, new guidance or updates to existing guidance will need to be undertaken from time to time.

27. If resources for developing new guidance documents or updating existing guidances are limited the decision on whether to refer reporters to existing resources depends on how closely the existing resources accurately reflect the reporting requirements for the PRTR at the time. Prior to referring reporters to materials developed for other PRTRs or materials developed to serve multiple PRTRs, it is important for a PRTR program to review these documents for consistency with the PRTRs' own current definitions and reporting requirements (e.g. is the definition of land releases consistent between the PRTR and the existing guidance documents? how do the set of chemicals discussed in existing guidance documents compare to the set of chemicals covered by the PRTR?). If there are major inconsistencies, existing guidance documents may not provide useful assistance to reporters. If there are minor inconsistencies, they should be communicated to reporters to avoid reporting errors.

2.8.2 *Other Reporting Assistance*

28. To supplement reporting guidance documents, it may also be useful to provide additional reporting assistance, such as:

- **Training Sessions** can be provided to instruct facilities in reporting to the PRTR. Training may be provided in a classroom setting, via webinar, or through online training modules.
- **Helpline/E-mail Support** can be provided to answer facilities' questions regarding reporting requirements, procedures, and release estimation. It may be useful to track the types of questions asked by facilities to 1) inform revision of guidance documents; and 2) publish answers to frequently asked questions.
- **Calculation Tools** can be developed to automate calculation of release, transfer, and waste management quantities. For example, a tool may be built where a facility enters activity information (e.g. production volumes, throughputs, operating conditions, etc.) and the tool applies emissions factors to estimate releases from the activity. Calculation tools 1) can be

⁷ For a list of existing guidance documents, see *Annex A. Support Materials*.

developed as stand-alone desktop tools that minimize the transfer of sensitive information; or 2) can be embedded into reporting software to improve reporting efficiency.

29. The types of guidance provided under Australia's NPI, Canada's NPRI, the E.U.'s E-PRTR, Japan's PRTR, the Protocol on PRTRs, and the U.S. TRI are summarized in Table 2. Note that under the E.U. E-PRTR and the Protocol on PRTRs, countries may provide additional training and guidance to facilities.

Table 2. Guidance Provided by Existing PRTR Systems

Option	PRTR Systems Employing Option					
	Australia NPI	Canada NPRI	EU E-PRTR	Japan PRTR	Protocol on PRTRs	US TRI
Guidance Documents						
Reporting Forms and Instructions	✓	✓	✓	✓	✓	✓
Guidance documents on Release Estimation Techniques (RETs)	✓	✓		✓	✓*	✓
Focused Guidance Documents	✓	✓		✓	✓*	✓
Other Reporting Assistance						
Training Sessions	✓	✓	✓**		✓*	✓
Helpline/E-mail Support	✓	✓		✓		✓
Calculation Tools	✓	✓		✓		✓

* Recommended under the Protocol on PRTRs. ** Provided by national agencies.

2.9 Obtaining International Support

30. Numerous resources are available to countries working to develop and implement PRTRs. To explore opportunities for support from organizations outside the country that have existing relationships within the country; a country may review international activities related to existing pollution prevention, cleaner production, emissions monitoring, or waste management programs (UNITAR and IOMC, 1997b). In addition, countries may identify opportunities for support through bilateral cooperation with countries that have established PRTRs and from international organizations that encourage the development or enhancement of PRTRs.

2.9.1 Bilateral Cooperation

31. Bilateral cooperation may be useful for countries developing PRTR systems; it may help meet countries' needs for assistance and training. Working with a country that has an established PRTR, a country developing a PRTR can obtain assistance that might not otherwise be available due to lack of resources. In addition, bilateral cooperation allows countries with established PRTRs to share their knowledge and expertise (UNECE, 2012a). It appears there are ample opportunities for bilateral assistance; a 2012 UNECE survey found 15 countries are willing to provide bilateral assistance covering multiple functional areas (UNECE, 2012b).

32. Examples of bilateral cooperation involving OECD countries include:

- Japan is currently working with Thailand to develop the basic design and emissions reporting scheme for a PRTR system in the Kingdom of Thailand and to strengthen capacity for estimating emissions, using PRTR data, and communicating risk;
- The United States worked with UNITAR to develop a strategy for the development of pollutant release & transfer registries (PRTRs) in each Central American country and the Dominican Republic; and
- Germany is working with Israel to improve Israel's PRTR and to provide training for regulators, data producers, and industry.

33. Further details and additional examples of bilateral cooperation involving OECD countries can be found in Annex B.

2.9.2 Support from International Organizations

34. Considerable support is available from international organizations for countries working to design and implement PRTRs. This support takes a variety of forms, including capacity building tools and funding programs. Current activities and resources include:

- **OECD's Task Force on PRTRs** provides outreach, including the provision of information and technical support related to PRTRs (OECD, 2014b).
- **The International Pollutant Release and Transfer Registers (PRTR) Coordinating Group** promotes capacity-building for PRTR systems in developing countries and countries with economies in transition through intergovernmental coordination (UNECE, 2009).
- **PRTR:Learn** is an interactive website that shares insights, information, knowledge and resources on PRTRs (UNITAR, 2014a).
- **PRTR.net** provides a global portal to PRTR information and activities from countries and organisations around the world to assist countries in the development, implementation and improvement of PRTR programmes (OECD, UNECE, and UNEP, 2014a).
- **The Strategic Approach to International Chemicals Management (SAICM) Quick Start Programme** provides support for initial enabling activities in developing countries, least developed countries, Small Island Developing States (SIDS)⁸ and countries with economies in transition (UNEP, 2008).

⁸ UNEP recognizes Small Island Developing States (SIDS) as a distinct group of developing countries with specific social, economic and environmental vulnerabilities (UNEP, 2011). SIDS are clustered into three regions – the Caribbean; the Pacific; and the Atlantic, Indian Ocean, Mediterranean and South China Sea Region (AIMS) (UNEP, 2011).

- **The UNEP Global Environment Facility (GEF)** provides co-financing to supports monitoring, reporting and information dissemination on persistent organic pollutants (POPs) using PRTRs (GEF, 2008).
- **UNITAR's PRTR Programme**, in cooperation with OECD and UNEP Chemicals, assists countries in the design of national PRTRs (UNITAR, 2014b).
- **The North American Commission of Environmental Cooperation's (CEC's) PRTR Project** seeks to promote comparability of North American PRTR data, improve the quality of the data, and engage stakeholders to exchange information and seek input on matters of mutual interest (CEC, 2014a).
- **UNECE** provides guidance on implementation of the Protocol on PRTRs (UNECE, 2014b).

Table 3. Case Study: UNITAR's PRTR Programme (UNITAR, 2014b)

The goal of UNITAR's PRTR Programme is to assist countries in the design of national PRTRs through multi-stakeholder processes. In collaboration with national governments and other international agencies, UNITAR has:

Provided PRTR-related capacity building activities to help countries perform infrastructure assessments, design PRTRs, perform feasibility studies, conduct PRTR pilot reporting trials, and develop National PRTR Proposals;

Launched a GEF-supported Global PRTR Project on Persistent Organic Pollutants (POPs) to demonstrate the value of using PRTRs as a monitoring and reporting system for Persistent Organic Pollutants (POPs) under the Stockholm Convention;

Developed PRTR:Learn, a PRTR Virtual Classroom, to provide a space for countries and experts to exchange information and knowledge on PRTRs, to facilitate on-line training and conferences, to provide links to technical resources, and to ensure coordination of PRTR implementation and capacity-building activities; and

Participated in regional workshops and meetings on PRTRs.

The UNITAR PRTR Programme is implemented in cooperation with OECD and UNEP Chemicals.

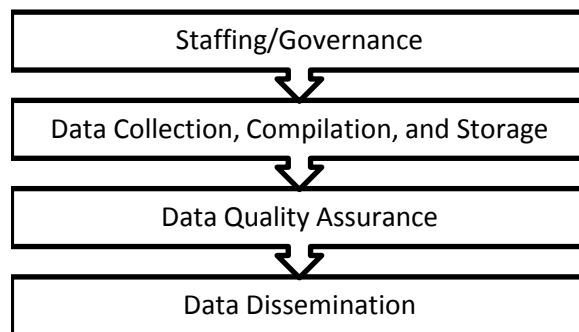
3 PRTR OPERATION

3.1 Introduction

35. This section describes the steps a country can take to operate a PRTR. These steps include:

- Identifying the responsible agency or agencies to oversee and staff the PRTR;
- Collecting, compiling, and storing PRTR data so that data flow from reporting facilities to the public;
- Performing data quality assurance to maintain high quality PRTR data; and
- Disseminating PRTR data so that it is available to the public.

Figure 2. Steps to Operate a PRTR



3.2 Staffing/Governance

3.2.1 Responsible Agency or Agencies

36. The government agency or agencies within the country responsible and empowered for operating each aspect of the PRTR will need to be identified or, in some cases, created (UNITAR and IOMC, 1997e). Typical responsibilities of governing agencies include data collection; data review and revision; data compilation; data storage; data dissemination; stakeholder outreach; compliance assistance; enforcement; and monitoring, improving, and enhancing the PRTR.

37. A single agency or multiple agencies may work together to implement a PRTR (UNITAR and IOMC, 1997d). For example, the responsible agencies that collect, review, compile, and disseminate PRTR data vary considerably across PRTRs:

- Facilities in Australia submit data to Australia's NPI through their state or territory environment agency. The state or territory agency reviews and forwards the data to the Australian Government. The Australian Government compiles and disseminates NPI data (Australian Government, 2012).
- Facilities in Canada submit data to Canada's NPRI through the national agency, Environment Canada (Environment Canada, 2014). Environment Canada reviews, compiles, and disseminates the reported data.
- Facilities in the European Union (E.U.) submit data to the E.U.'s E-PRTR through a competent authority within their country (e.g. the national environmental agency). The competent authority reviews the reported data and then submits it to the European Environment Agency. The European Environment Agency compiles and disseminates E-PRTR data (European Commission, 2006).
- Facilities in Japan submit data to Japan's PRTR through the prefectural government. The prefectural government forward reported data to the national government. The national government compiles the data. Both the national and prefectural government disseminate the reported data (Government of Japan, 2001).
- Facilities in the United States (U.S.) submit TRI data to both the U.S. government [Environment Protection Agency (EPA)] and to their respective state government and, where applicable, tribal government (U.S. EPA, 2014a). The U.S. EPA reviews the reported data. The U.S. EPA, state agencies, and tribal agencies disseminate TRI data.

38. Existing programs and regulations may influence which agencies oversee each aspect of a PRTR. For example, a country may select a government agency to conduct data collection if the agency is already empowered to collect information under existing laws or if it has experience in data collection under other programs (UNITAR and IOMC, 1997e). Consultation with stakeholders and results from PRTR pilots can also inform selection of governing agencies. For example, Australia implemented PRTR data collection at a local level following a test study that indicated citizen support would be improved if the PRTR was seen as locally relevant (OECD, 1996).

3.2.2 *Staffing*

39. It will also be necessary to identify or establish the personnel within the responsible agency or agencies who will perform tasks to implement the PRTR. When staffing a PRTR, a country may identify (UNITAR and IOMC, 1997e):

- Required skills for PRTR staff (e.g. an understanding of database administration to perform data compilation and storage);
- Whether there are personnel within the responsible agency who have training relevant to PRTR operation (e.g. training in information technology, chemicals safety, communication, data analysis, etc.); and
- Additional training that might be needed for PRTR staff.

3.3 Data Collection, Compilation, and Storage

40. PRTR data originate at the facilities that report to a PRTR. Facilities record and submit the data using reporting forms or reporting software. The governing agency or agencies then gather, compile, review, store and disseminate the PRTR data for use by the public (Figure 3. Figure 4). For PRTRs designed to incorporate non-point sources, the governing agency or agencies also estimate, store, and disseminate data on releases and transfers from non-point sources (Figure 5. Figure 6). Each step of this process requires procedures and infrastructure be put in place so that data flow systematically from reporting facilities to the public.

Figure 3. Figure 4. Typical Flow of PRTR Point Sources Data from Facilities to the Public

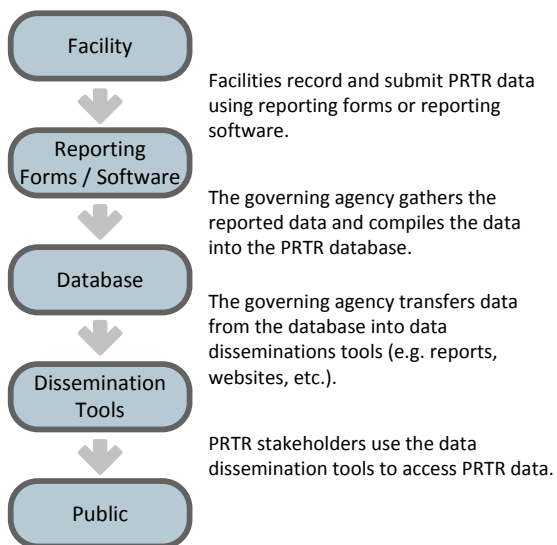


Figure 5. Figure 6. Typical Flow of PRTR Data on Non-point Source

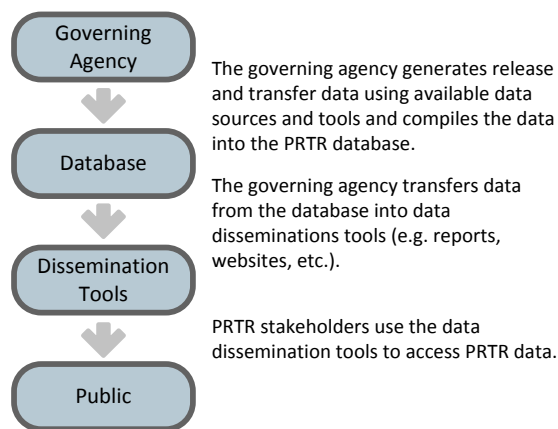


Table 4. Case Study: Chile’s Single Window of Reporting (Ulloa, 2013; UNITAR, 2013)

Initially, data for the Chilean PRTR were collected through separate sectorial systems managed by multiple government agencies (e.g. facilities reported air and waste data to the Ministry of Health and waste water data to the Superintendent of Sanitation Services). Through interagency agreements, these data were then transferred to a central PRTR data centre. Under this reporting system, it was difficult to combine data collected by each agency; facilities were obligated to report in duplicate, information was incomplete, and the Ministry of the Environment relied on voluntary transfer of data from other agencies to the PRTR.

In 2013, Chile introduced a “Single Window” of reporting that captures relevant environmental information under each of the various sectorial reporting systems. This information is transferred directly to the central PRTR data centre. Data relevant to each sectorial system are then routed to the appropriate government agency. Under the “Single Window,” facilities are tracked using a single identifier, PRTR data are more complete, facilities must only report to one reporting system, and the transfer of PRTR data from the public to the Ministry of Environment is obligatory.

3.3.1 Collecting PRTR Data

41. There are a variety of mechanisms for collecting PRTR data from point sources, including paper reporting forms, electronic media (e.g. CD-ROMs), and web-based reporting (OECD, 1996; UNITAR and IOMC, 1997e). These mechanisms vary in terms of required resources (Table 5). Whenever feasible, it is preferable to develop and use electronic systems, as they can 1) save considerable resources and time for both the regulated community and the PRTR program through more efficient data processing; 2) improve data quality through embedded data validation checks and avoidance of data entry errors caused by responsible agency staff misreading or mistyping reported information; and 3) enable faster dissemination of the data to end-users⁹ (OECD, 1996, 2008a).

Table 5. Required Resources and Data Quality for PRTR Data Collection Mechanisms

Mechanism	Required Resources to:		Data Quality
	Develop Mechanism	Process Reported Data	
Paper Forms	Lower: <ul style="list-style-type: none"> Paper forms require no software development 	Higher: <ul style="list-style-type: none"> PRTR staff must perform data entry by hand for every data point 	Lower: <ul style="list-style-type: none"> Data validation cannot be embedded into paper forms Data quality issues are introduced through misinterpretation of hand written values and data entry errors
Electronic Media	Medium: <ul style="list-style-type: none"> Reporting software must be developed for reporters to produce electronic submissions 	Medium: <ul style="list-style-type: none"> PRTR staff must transfer data files from electronic media to the PRTR database Transfer of data points within electronic files is automated 	Higher: <ul style="list-style-type: none"> Data validation and reporting instructions can be embedded reporting software Automated data processing avoids data entry errors
Web-Based Reporting	Higher: <ul style="list-style-type: none"> Reporting software must be developed for reporters to produce electronic submissions Infrastructure must be developed for collecting submissions via the Web 	Lower: <ul style="list-style-type: none"> Transfer of data from reporters to PRTR database is automated 	Higher: <ul style="list-style-type: none"> Data validation and reporting instructions can be embedded reporting software Automated data processing avoids data entry errors

42. If a PRTR collects sensitive information (e.g. trade secrets), a country may also need to implement processes to secure the information. In general, web-based data collection systems are easier targets for potential hackers than submission of paper forms or electronic media. If a PRTR collects sensitive

⁹ The responsible agency for a PRTR often performs data quality assurance checks prior to releasing data to the public. There is a trade-off between releasing PRTR data that has been reviewed for data quality and releasing the data sooner rather than later. As time is needed to perform these data quality checks, data quality assurance may delay the release of PRTR data. When data validation is embedded into reporting software, many data quality checks are performed before the data are reported, so the responsible agency may need less time for data quality assurance prior to releasing PRTR data.

information through a web-based reporting system, security solutions will be needed to protect the information. A country may also consider using a separate mechanism to collect sensitive information; for example, the U.S. EPA now collects all TRI data through web-based reporting software, with the exception of trade secret information which is still collected using paper reporting forms. Note that additional considerations for designing a PRTR to protect trade secrets and other sensitive information are discussed in Section 2.4.2 of *Guidance on Elements of a PRTR: Part I* (OECD, 2014a).

43. There are two main options for developing reporting software to collect PRTR information from point sources.

- It may be possible to develop reporting software for a PRTR by adapting software created for an existing PRTR system or by expanding software used to collect data for other programs within the country to collect data for a PRTR (OECD, 1996; UNITAR and IOMC, 1997e).
- If a PRTR system has substantially different or unique reporting requirements, a country may instead develop new reporting software.

3.3.2 *Estimating Releases from Non-point Sources*

44. Data on releases from non-point sources are developed by the responsible agency. When estimating releases from non-point sources, it is important to first identify which non-point sources will be included in the PRTR. Non-point sources relevant to a PRTR may include (OECD, 2003b):

- **Area sources**, including
 - Groups of small stationary point source facilities that do not exceed the reporting thresholds for the PRTR (e.g. a single small dry cleaner may not qualify for PRTR reporting as a point source, so the small dry cleaners in an area may be grouped together as an area source)
 - Numerous very small sources spread over extensive areas (e.g. residential wood combustion, pesticide use);
- **Mobile sources** – non-stationary sources (e.g. automobiles, aircraft);
- **Biogenic sources** – biological non-anthropogenic sources (e.g. microbial activity)
- **Geogenic sources** – other non-anthropogenic sources (e.g. volcanoes).

45. For each non-point source to be included in the PRTR, the responsible agency will need to identify the data sources and tools available for estimating emissions. These tools and sources may include parameters that can be easily obtained (e.g. number of employees, number of vehicle miles travelled, etc.); emissions factors and engineering data; geographic information systems (GIS); and computer models (e.g. hydrology/water flow models) (UNITAR and IOMC, 1998b). Using this information, the responsible agency may be able to construct an approach to estimating emissions that combines readily available parameters and emissions factors for the parameters (UNITAR and IOMC, 1998b). The responsible agency may also need to develop computer models to analyse input data and estimate releases (OECD, 1996).

46. For data on releases from non-point sources to be consistent with PRTR data for point sources, the responsible agency may aim to develop a method for estimating releases for all media and pollutants

covered by the PRTR at a community level; however, the quality and availability information for each source will determine the feasibility of estimating emissions and the level accuracy of emissions estimates (UNITAR and IOMC, 1998b).

3.3.3 Data Processing

47. A data flow model is needed to outline data management procedures for systematic processing of PRTR data in each step of the PRTR reporting cycle (UNITAR and IOMC, 1997e). These steps include receiving reported data from point sources; generating data for non-point sources (if covered by a PRTR); compiling and storing data for point sources and non-point sources; revising data to resolve data quality issues; and disseminating data.

48. Factors to consider when devising a data flow model include:

- **Data Quality.** Data quality controls should be implemented at all stages: data development, collection, compilation, processing, storage, revision, and dissemination (see Section 3.4) (UNITAR and IOMC, 1997e).
- **Transfer of data among governing agencies.** In PRTRs where data is collected by local authorities and then transferred to a national authority, it is important to consider how to coordinate data processing and transfer between the authorities (OECD, 1996; UNITAR and IOMC, 1997e). For example, use of compatible computer systems can ease transfer of data from local authorities to national authorities (OECD, 1996).
- **Security.** Data management procedures may be developed to identify and protect data claimed as confidential by reporters (UNITAR and IOMC, 1997e). Note that additional considerations for designing a PRTR to protect trade secrets and other sensitive information are discussed in Section 2.4.2 of *Guidance on Elements of a PRTR: Part I* (OECD, 2014a).
- **Automation.** Automating data processing steps can improve efficiency of data management procedures and data quality.

3.3.4 IT Infrastructure and Database

49. IT infrastructure and a PRTR database are needed to compile and store PRTR data. Key considerations for the design of IT infrastructure and databases to store PRTR data include:

- The data that will be stored in the database, such as:
 - Each data element reported by point-source facilities;
 - Data on diffuse sources, if covered by the PRTR;
 - Derived data (e.g. total releases = sum of air, water, and land releases); and
 - Metadata (e.g. date submitted, reporting format, date revised etc.);
- The size of the database needed to house the data (UNITAR and IOMC, 1997e);

- The structure of the database to organize the data;
- The frequency of data refreshes or updates;
- Procedures for exporting data from the database (e.g. exporting raw data; exporting data for routine analysis (e.g. data structured for analysis in periodic data quality reviews); data feeds for updating data dissemination tools);
- Procedures for database management (e.g. version control, back-up, etc.) (UNITAR and IOMC, 1997e);
- Techniques for safeguarding sensitive information (UNITAR and IOMC, 1997e);
- Where the database will be hosted (UNITAR and IOMC, 1997e);
- Hardware, software, and equipment requirements (UNITAR and IOMC, 1997e);
- Available resources for database development and maintenance (OECD, 1996; UNITAR and IOMC, 1997e).

3.3.5 Harmonisation of Data Collection, Compilation, and Storage

50. To promote information sharing and integration, a country may consider developing compatible data systems (OECD, 1996). For example, PRTR systems may be harmonised through use of:

- International identifiers and other parameters (e.g. Chemical Abstracts Service Registry (CAS) Number) (OECD, 1996);
- Consistent conceptual data handling, organisational data flow models, and logical data models (OECD, 1996); and
- UN Electronic Data Interchange (EDI) standards (OECD, 1996; UNECE, 2014a).

51. In addition, it may be possible to devise flexible and broadly applicable software through cooperative efforts to develop PRTR data collection and management systems (OECD, 1996). Currently, several governments and organisations provide open source software and information exchange schemes that can be adapted for use by other PRTR systems, including the E.U.'s E-PRTR, the German PRTR, and PRTR España (OECD, UNECE, and UNEP, 2014b).

3.4 Data Quality Assurance

3.4.1 Importance of Data Quality Assurance

52. The OECD Council on Implementing PRTRs recommends that countries take into account the principle that the data handling and management capabilities of the system should allow for verification of inputs and outputs (OECD, 2003a). Data quality is an essential component of a PRTR; high quality data reduces uncertainty in results from analyses of the data and, therewith, optimizes the integrity of conclusions drawn from such results (OECD, 2008a). Maintaining high quality data is important for meeting national goals for the PRTR; for example, high quality PRTR data can be used to perform sound

evaluations of the progress of national environmental policies. If PRTR data are lower in quality, these goals may not be met; analysts may not be able to draw conclusions about environmental policies due to uncertainties in analytical results. In addition, high quality data are more readily harmonised with data from other PRTRs; if all PRTR data are of high quality, analyses of data from multiple PRTR systems do not need to account for variation in uncertainty among PRTRs.

3.4.2 *Review and Revision of PRTR Data*

53. For most PRTRs, the laws that require facilities to report release and other waste management quantities of certain toxic chemicals or pollutants usually do not require that these quantities be measured or otherwise determined experimentally— although if by coincidence measurement is required under other regulations these measured values can also be used for PRTR reporting purposes. When measured data are not “readily available”, which is usually the case, the prevailing regulations usually only require that facilities determine their release and other waste management quantities of chemicals by making “reasonable estimates”. Implicit in the allowance of reasonable estimates is that the regulations recognize and permit that the data need only to be reasonably accurate in regard to the intended uses of such data.

54. In any case, the quality of PRTR data and related information that is submitted to an environmental authority is typically the responsibility of the facilities that are required to submit such data and information. In some situations, however, the agencies responsible for collecting and compiling PRTR data may be required to assess the quality of submitted information. For example, the E-PRTR Regulation states that the competent authorities from each country “shall assess the quality of the data provided by the operators of the facilities... as to their completeness, consistency and credibility.” Nonetheless, given the widespread use and importance of the PRTR data as an information source and decision making tool, most PRTR programs are voluntarily proactive in identifying and implementing activities aimed at optimizing the quality of the data. As discussed in Section 2.8, a PRTR program may provide reporting assistance via: development of industry-specific and chemical-specific technical guidance documents; detailed reporting forms and instructions, sponsoring training workshops; establishment of information centres. Additional steps a PRTR can take to optimize the quality of PRTR data include:

- **Reviewing reported data** to identify potential data quality issues (OECD, 2008a). For example, it is possible to analyse PRTR data to identify outliers, records with large changes between years, and records with internal inconsistencies that may indicate data quality issues.
- **Contacting facilities** with potential data issues to verify reported data (OECD, 2008a; UNITAR and IOMC, 1997e). The reporters of the data can often confirm whether anomalous data points are accurate. For example, a reported ten-fold increase in releases of a chemical between consecutive years at first may appear to be an error, but upon contact with the facility the ten-fold increase is confirmed. A facility may also be able to confirm a reporting error and provide revised information to resolve the issue. Contact may take the form of phone calls, e-mails, letters, or site visits.
- **Establishing error correction procedures** to allow facilities to revise reported data (OECD, 2008a; UNITAR and IOMC, 1997e). These procedures may include considerations for:
 - The responsible party for providing revised data (e.g. database revisions are prompted only when facilities submit revised reports, the governing agency may revise reported data at its discretion);

- The mechanisms facilities will use to report revised data to the PRTR (e.g. reporting software, a unique form for revisions); and
- Version control for revising records within the PRTR data system (Will data be periodically frozen? Will the original record be maintained? How will different versions of a record be differentiated?).
- **Embedding data quality checks in reporting software** (OECD, 2008a). When data quality checks are included in reporting software, data can be reviewed before they are reported to the PRTR. These checks can include validation steps for data fields (e.g. checking that no text is entered into a numeric field), internal consistency checks (e.g. checking that a facility's address is consistent with its state/province/region), checks for missing values (i.e., checking that all required field are complete) and checks against data reported in prior years or by similar facilities (e.g. checking for large increases or decreases in reported releases or transfers compared to the prior year).
- **Developing stand-alone data validation software** (OECD, 2008a). Data validation software may be used to automate review of reported data and to produce output reports listing potential data quality issues. Software can range from basic (e.g. checking for large changes in reporting) to more sophisticated (e.g. reviewing patterns in reporting by sector and chemical and identifying potential data quality issues where records deviate from those patterns).

3.4.3 *Determining Data Reviewed before Release*

55. A country should also determine the degree to which data will be reviewed before they are released to the public. There is a trade-off between releasing data that has been subjected to data quality checks and releasing the data sooner rather than later; the time needed to perform data quality checks may delay publication of PRTR data. A factor to consider in this decision is whether the reporters or the PRTR program are held primarily responsible for data quality. For example, if reporters are held responsible for the quality of the data they submit, a PRTR may release data following minimal review, under the assumption that reporters have already performed their own data quality checks. In contrast, PRTRs where the government agency takes greater responsibility for data quality may perform more extensive reviews of PRTR data prior to their release.

3.5 **Data Dissemination**

56. The OECD Council on Implementing PRTRs considers making data available to the public to be a core element of a PRTR system (OECD, 2003a); stakeholders need access to PRTR data in order to use and benefit from the information contained in a PRTR system.

3.5.1 *Options for Disseminating PRTR Data*

57. There are several options a country may consider when designing mechanisms to disseminate PRTR data to stakeholders. For example,

- At what level of aggregation should PRTR data be made available? Options include:
- Publishing records for individual chemicals and facilities;

- Aggregating records prior to publication (e.g. presenting release and waste management totals by chemical, industry, or geographic region).
- In what format should PRTR data be made available? Options include:
 - Reports that provide summaries of PRTR data with interpretive text;
 - Raw data files/databases;
 - Analytical tools (e.g. searchable databases, mapping tools, pre-set query tools, ad hoc query tools);
 - Press releases highlighting important trends or data points;
 - Analyses combining PRTR data with other data (e.g. toxicity/risk measures, ambient conditions);
 - Fact sheets designed for a specific audience (e.g. concerned citizens) or end use;
 - Exports and Application Programming Interfaces (APIs) designed for integration with data from other PRTRs.
- Where should data be located or accessible? Options include:
 - A stand-alone website for the PRTR;
 - Webpages within environmental agency websites;
 - Websites providing international PRTR data (e.g. Taking Stock Online, OECD Centre for PRTR Data, E-PRTR);
 - Public libraries;
 - Housed by a competent authority and available upon request.

58. Since data needs and end uses vary among stakeholders, the most appropriate and efficient mechanism for dissemination, access, and use will vary. For example, concerned citizens may benefit most from simple fact sheets created by an environmental authority that summarize and interpret PRTR data reported by facilities near where they live or work. In contrast, researchers may benefit most from raw data files useful for many types of analysis. For PRTRs serving multiple stakeholder groups, multiple tools for accessing and using the data may be needed.

59. PRTR data also can be provided together with supplemental information such as guidance documents on how PRTR data should (or should not) be interpreted, regulatory information, hazard information (e.g. toxicity) and exposure information (OECD, 2013a). Providing contact information (e.g. telephone number, e-mail, online form for inquiry) with published datasets, documents, or analytical tools may also be considered to collect feedback from data users.

60. The mechanisms for disseminating PRTR data from Australia's NPI, Canada's NPRI, the E.U.'s E-PRTR, Japan's PRTR, the Protocol on PRTRs, and the U.S. TRI are summarized in Table 6. In addition, the case study below provides details dissemination of PRTR data in Spain. Note that mechanisms for disseminating PRTR information vary among the EU countries covered by E-PRTR. For instance, in the Spanish PRTR web site, there are many PRTR documents in .pdf format (e.g., legal, technical, informative, etc.). Also, in Spain, the published information on the website is readily available and additional environmental information is available upon request.

Table 6. Dissemination of Information by Existing PRTR Systems

Option	PRTR Systems Employing Option					
	Australia NPI	Canada NPRI	EU E-PRTR	Japan PRTR	Protocol on PRTRs	US TRI
Level of Aggregation						
Individual Facilities/Chemicals	✓	✓	✓	✓	✓*	✓
Aggregate Records	✓	✓	✓	✓	✓*	✓
Format						
Summary and interpretive reports	✓	✓		✓	✓*	✓
Raw data files/databases		✓	✓	✓		✓
Analytical tools	✓	✓	✓	✓	✓*	✓
Press releases			✓	✓	✓*	✓
Fact sheets	✓			✓		✓
Exports for integration with other PRTRs.	✓	✓	✓	✓		✓
Analyses combining PRTR data with other data	✓	✓		✓	✓*	✓
Location						
Stand-alone website for the PRTR	✓		✓	✓	✓**	
Webpage within environmental agency website		✓		✓	✓**	✓
Websites providing international PRTR data	✓	✓	✓	✓		✓
Public libraries					✓***	✓
Available upon request				✓	✓***	

* Recommended under the Protocol on PRTRs

** The Protocol on PRTRs does not distinguish whether a website should stand alone or fit within an environmental agency site.

*** Recommended under the Protocol on PRTRs, if resources are not available for developing a website.

Table 7. Case Study: Application, Use and Presentation of PRTR Data in the Spanish Register of Emissions and Pollutant Sources, PRTR-España (Government of Spain, 2014a, 2014b)

PRTR-España is designed as an integrated tool for gathering, managing and disseminating Spain's PRTR data via the Internet. This tool is structured with two levels of access that have different functionalities: Member Area and Public Information.

Within the member area,

- **Owners and operators** can access and download PRTR data for their facilities, including both reported and validated data. Owners and operators may also use the tool to ask questions about reporting requirements during the reporting period.
- **Competent authorities** in the Spanish government can revise and validate reported data. Competent authorities may also use the tool to ask questions during the reporting and validation process.
- **System administrators** can control and maintain the tool, manage users, view statistics and legal requirements, and validate uploaded files.

Within the public site, users can search for PRTR data using various parameters (e.g., river basin district, industrial activity, pollutant substance, etc.) and view results as tables, graphics, and maps. Users can also access technical documents, references documents, and legislation relevant to the PRTR. Annually, over 1 million users from over 150 countries visit the PRTR-España public site. To facilitate access for the international users, information is presented in 5 languages.

Users who need data beyond those published on the public site can user PRTR- España to request additional validated data. Typically, these requests are made by universities, technological institutions, and NGOs for pollution studies and scientific projects.

3.5.2 Disseminating PRTR Data for Use in Global Scale Analyses

61. To ensure PRTR information is accessible to stakeholders interested in conducting global scale analyses, a country should consider implementing mechanisms for disseminating PRTR data that facilitate integration with data from other PRTRs. Successful mechanisms would:

- **Publish key data elements for global scale analyses**, including facility identification, industrial classification, chemical identification, releases by environmental media, and transfers (Table 8).^{10,11} Presenting these data for each facility and chemical allows stakeholders to select the

¹⁰ Note that a country may also consider publishing additional data elements; many PRTRs collect other data that may be of use in global scale analyses. For example, parent company information is collected by many PRTRs and is desirable data element in analysis of PRTR data, but may not be comparable on a global scale due to differences in names of a company's subsidiaries located throughout the world. For details on additional data elements collected by PRTRs, see Section 2.2.5 in *Guidance on Elements of a PRTR: Part I* (OECD, 2014a).

¹¹ Note that it may be useful to publish PRTR data in multiple languages to make data more accessible to international users.

records that are most appropriate to use in combination with records from other PRTRs. For example, a stakeholder that wishes to combine data from two PRTRs could select records where the chemical is covered by both PRTRs and the facility is in a sector covered by both PRTRs.

Table 8. Minimum Data Elements for Global Scale Analysis

Category	Data Element
Facility Identification	<ul style="list-style-type: none"> • Facility identification number • Facility name • Facility address
Industry/Economic Classification	<ul style="list-style-type: none"> • Industry/economic code for the facility (e.g. ISIC code).
Chemical Identification	<ul style="list-style-type: none"> • CAS number • Other chemical identification numbers (used for chemicals reported as groups) • Chemical name
Releases by Environmental Media	<ul style="list-style-type: none"> • Quantity released to air over the reporting period • Quantity released to water over the reporting period • Quantity released to land over the reporting period
Transfers	<ul style="list-style-type: none"> • Quantity transferred off-site over the reporting period
Documentation for interpretation (see the next bullet)	<ul style="list-style-type: none"> • Definition, activity thresholds, inclusion of point/diffuse sources, releases estimation techniques, reporting period (e.g. 2013), reporting unit (e.g. tonnage/year)

- **Include documentation for interpretation of PRTR data.** Documentation would allow a stakeholder to identify similarities and differences between PRTRs that would, in turn, inform development of appropriate methods for analysing PRTR data and interpreting results in global scale analysis. It would be published at the same time as and travel with datasets intended for global scale analysis. Documentation might include:
 - Definitions for each data element included in the dataset;
 - A discussion of the reporting universe (e.g. covered sectors, chemicals, activity thresholds, inclusion of point/diffuse sources) with definitions for key terms (e.g. reporting unit, chemical groups);
 - Notes on release estimation techniques employed to generate PRTR data;
 - Version information (e.g. date last updated, reporting years included)
 - Any potential data caveats (e.g. optional reporting, sanitization of sensitive information).

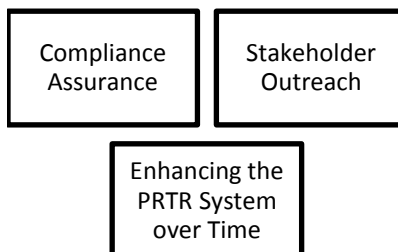
4 LONG TERM SUCCESS

4.1 Introduction

62. This section describes actions countries can take to promote the long term success of a PRTR. These actions include:

- Performing compliance assurance so that regulated entities comply with PRTR reporting requirements and report accurate and complete data;
- Providing outreach to PRTR stakeholders to promote use of PRTR data, to help stakeholders access, understand, and interpret PRTR data, and to foster collaboration;
- Enhancing the PRTR system over time to improve system performance, expand the scope of the PRTR, and enhance the quality of PRTR data.

Figure 7. Actions to Promote Long Term Success



4.2 Compliance Assurance

63. The OECD Council on Implementing PRTRs recommends that countries take into account the principle that a compliance mechanism to best meet the needs of the goals and objectives should be agreed on by affected and interested parties (OECD, 2003a). Compliance mechanisms can prevent or address non-compliance with PRTR regulations and reporting requirements, including:

- Failure to report to the PRTR;
- Failure to report for one or more chemicals;
- Reporting late (i.e., submit reporting forms after the reporting deadline);

- Reporting incomplete data (e.g. null data in required data elements);
- Reporting erroneous data (e.g. inconsistent or miscalculated data).

64. Compliance mechanisms may take the form of compliance promotion, compliance monitoring, or enforcement (OECD, 2009).

4.2.1 Compliance Promotion

65. For both voluntary and mandatory PRTRs, compliance promotion may help facilities follow reporting procedures and submit high quality data to a PRTR. As discussed in Section 2.8, a PRTR may provide assistance to help facilities understand the process for gathering data and reporting to the PRTR. This strategy may be effective for avoiding non-compliance caused by a lack of knowledge or a lack of capacity to comply with PRTR reporting requirements (OECD, 2009). In addition, a country may consider providing incentives to encourage facilities to report to a PRTR (UNITAR and IOMC, 1997e).

4.2.2 Compliance Monitoring and Enforcement

66. For PRTRs with mandatory reporting mechanisms, compliance monitoring can be used to detect non-compliance through instruments including include inspections, audits to identify root causes of non-compliance, off-site record reviews, and regular meetings between inspectors and operators to discuss existing and potential compliance issues (OECD, 2009). Enforcement may be used to address non-compliance. Enforcement responses may be designed to return the violator to compliance; correct management problems; impose sanctions to punish the violator and deter others; remove economic benefits of non-compliance; or correct damages (OECD, 2009). To select which mechanisms will be used, a country may consider what regulations can be used to enforce PRTR compliance and what enforcement responses are possible under those regulations (UNITAR and IOMC, 1997e). Countries may also consider what penalties should be issued for non-compliance (UNITAR and IOMC, 1997e).

4.2.3 Effects of Compliance Assurance on Data Quality

67. Successful compliance assurance can result in more accurate and complete PRTR data. For example:

- Compliance assistance can help facilities better understand their reporting requirements and improve their ability to submit high quality information (OECD, 2008a).
- Compliance monitoring can lead to improved PRTR data quality; when reporting errors are identified by an inspector, records for the facility can be updated to resolve the errors (OECD, 2008a). In addition, when inspections review reporting methodologies with facility staff, they can improve staff understanding of methodologies and the quality of data they report to the PRTR in the future (OECD, 2008a).
- Enforcement actions can result in facilities providing data in a more timely fashion; when PRTR data are reported on time, published datasets are more complete and the quality of reported data can be reviewed prior to publication (OECD, 2008a).

68. As discussed in Section 3.4, maintaining high quality data allows PRTR data to be analysed and interpreted without unreasonable concern for uncertainties in analytical results. When compliance

assurance activities result in high compliance rates with PRTR reporting requirements, PRTR data can be used for all intended applications and can be more readily harmonised with data from other PRTRs.

4.3 Stakeholder Outreach

69. Section 3.5 of this document discusses dissemination of PRTR data so that it is available to the public. Data dissemination is a key step in helping stakeholders to access and use PRTR data; however, additional outreach may be needed to:

- Make the public aware that the PRTR is available for their use;
- Help stakeholders understand how to use and interpret PRTR data;
- Build and maintain user community relations;
- Collaborate with other PRTRs.

4.3.1 PRTR Promotion

70. In order for stakeholders to use and benefit from PRTR data, they need to know that PRTR data are available for their use. To inform the public about a PRTR, a country may take steps to market and publicize PRTR information (OECD, 1996, 2000). Activities to promote the use of PRTR data include:

- Issuing press releases or holding press conferences to announce public data releases, major reports, or tools associated with PRTR data (OECD, 1996, 2000).
- Supporting the news media in their efforts to use PRTR data for context in articles related to the environment (OECD, 2000).
- Using social media or automated e-mail lists to send notices to interested parties (OECD, 2000).
- Assisting non-governmental organizations (NGOs), academia, and other bodies in their efforts to analyse and further publicize PRTR data (OECD, 1996, 2000). This assistance may include providing data in a format useful for an organization or helping the organization to interpret PRTR data.
- Developing outreach tools ranging from fliers to websites to media campaigns (OECD, 2000).

4.3.2 Training PRTR Data Users

71. A country may provide training to PRTR data users, so that they better understand how to access, use, and interpret results of analyses involving PRTR data (OECD, 1996). Common approaches to training include conferences, workshops, webinars, web tools, on-site training for regional and local groups, and fliers (OECD, 2000). As stakeholders' background, analytical skills, and interest in PRTR data varies considerably, separate materials and training methods may be established for different groups (OECD, 1996). For example, Australia's NPI provides an educational website for teachers and students with training materials that are tailored for student age groups (Australian Government, 2014).

72. In addition, a country may help stakeholders use PRTR data by providing (OECD, 1996):

- Clear documentation to explain the nature of the PRTR database and the data it contains;
- Direct access to government employees to ask questions concerning PRTR data (e.g. via a telephone hotline or webinar); and
- Technical support services.

4.3.3 *Building and Maintaining User Community Relations*

73. To develop and maintain relationships with PRTR data users, a country may employ mechanisms for exchanging ideas with and gathering feedback from users (OECD, 1996, 2013a). A country may engage with data users through formal programs (e.g. a program may be developed to identify and establish relationships with community leaders who are concerned with environmental and health issues) or within the context of existing relationships (e.g. possible applications of PRTR data may be discussed within standing meetings between government agencies). When engaging with data users, it is important to keep in mind their interest and motivation for using PRTR data. For example,

- **Community members** may be interested in learning about releases of pollutants and potential health effects in their community.
- **Government agencies** may be interested in how PRTR data can be used to support programs evaluate program performance, to guide decision making processes, or for prioritization purposes.
- **Industry** may be interested in applying PRTR data to:
 - Improve the efficiency of industrial processes;
 - Share and showcase pollution prevention achievements (as reported) at both the facility and parent company level to demonstrate corporate responsibility;
 - Bench-mark against other facilities/parent companies within their sector using release and other waste management quantities reported to a PRTR or PRTRs;
 - Track progress toward corporate sustainability goals; and
 - Identify opportunities for cost savings.
- **NGOs** may be interested in PRTR data to assess environmental conditions, inform the public, or be leveraged to encourage pollution prevention.
- **Researchers and academics** may be interested in learning how PRTR data can be applied to research on a variety of topics (e.g. environmental policy, economics, public health, etc.).
- **The financial community** may be interested in how PRTR data can be used to inform investment decisions.

- **The news media** may be interested in how PRTR data can be used to investigate or provide context for news stories.

Table 9. Case Study: U.S. EPA’s Toxics Release Inventory (TRI) University Challenge (U.S. EPA, 2014b)

The U.S. EPA’s Toxics Release Inventory (TRI) University Challenge aims to increase awareness of the TRI Program and TRI data within academic communities and to expose students to TRI data, tools, and analysis. Each year, university students, faculty, and researchers apply to conduct projects that benefit communities, the environment, academic institutions, and the TRI Program. From the applicants, the U.S. EPA selects University Challenge partners to participate in the program. Partners receive:

- Support from staff experts to answer questions, assist with TRI tools and data analysis, and advance TRI-related research and knowledge;
- National recognition and promotion for their university (students and project activities are featured on the TRI University Challenge website and are offered opportunities to speak at conferences and events);
- Networking events and webinars; and
- Practical experience working on environmental issues with the U.S. EPA.

Through the University Challenge, partners generate outputs that are beneficial to the U.S. EPA, including innovative programs, activities, recommendations, and research.

4.3.4 *International Collaboration*

74. Collaboration with international organizations (e.g., OECD’s Task Force on PRTRs, UNECE’s International PRTR Coordinating Group, the Commission for Environmental Cooperation (CEC) of North America), other countries, and NGOs can promote harmonisation of PRTR data and application of PRTR data in international-scale analysis. International collaboration activities may include:

- Identifying data needs for international scale analysis and assessing whether PRTRs currently meet those needs or could be adjusted to meet those needs;
- Compiling data from multiple PRTRs into a single database, so that data are readily available for international-scale analyses (e.g. Taking Stock Online (CEC, 2014b), OECD Centre for PRTR Data (OECD, 2014c), E-PRTR (EEA, 2009));
- Developing analytical methods for harmonising PRTR data (e.g. developing crosswalks between the industry classification codes reported under each PRTR system);
- Communicating analytical outputs and outcomes;
- Sharing best practices for PRTR design and operation.

4.4 Enhancing the PRTR System over Time

75. The OECD Council on Implementing PRTRs recommends that countries take into account the principle that any PRTR system should allow for mid-course evaluation and have the flexibility to be altered by affected and interested parties in response to changing needs (OECD, 2003a). Periodically, a country may make improvements to a PRTR system through monitoring of the PRTR's performance, expanding of the scope of the PRTR, and taking actions to improve the quality of PRTR data.

4.4.1 *Monitoring and Improving the PRTR System Performance*

76. To evaluate the performance of a PRTR, a country may monitor:

- Whether a PRTR is meeting the national and harmonisation goals set during PRTR initiation (OECD, 1996). For example, a country might review trends in releases and survey reporters about their pollution prevention activities to determine whether a PRTR is meeting a goal to promote reduction of releases;
- Benefits and costs of a PRTR (e.g. avoided adverse environmental affects, procurement of IT infrastructure, facility personnel needed to track and report release and transfer data, etc.) (OECD, 1996);
- Routine operations of a PRTR (e.g. data handling and management mechanisms, data verification and validation, data dissemination, etc.) (OECD, 1996);
- How the PRTR fits in the context of national environmental policies and priorities (OECD, 1996);
- Harmonisation of a PRTR with other PRTR systems (e.g. overlap of the reporting universe with other PRTRs, utility of PRTR data for use in international-scale analyses).

77. Insights from these evaluations may be used to promote the continuation of successful practices or to identify areas where the PRTR needs to be improved or adjusted.

4.4.2 *Expanding the Scope of a PRTR*

78. Once a PRTR has been established, a country may enhance the system by gradually expanding its scope. Opportunities for enhancement include:

- Expansion of the PRTR following recommendations for further development outlined in the National PRTR Proposal (e.g. phasing in additional data elements, expanding the PRTR to support additional applications and uses) (UNITAR and IOMC, 1997d).
- Expansion of the PRTR's reporting universe to cover emerging industrial sectors and chemicals within the country; and
- Expansion of the PRTR to collect information relevant to emerging global environmental issues, including those covered by international agreements.

4.4.3 *Improvement of Quality of PRTR Data*

79. To complement ongoing data quality assurance activities, PRTR data may be improved through enhancement of the PRTR system. For example, opportunities for improving the quality of PRTR data include:

- Improving Release Estimation Techniques (RETs) by identifying new techniques and data (e.g. emissions factors) as they become available, updating guidance documents for point sources to incorporate this information, and applying improved RETs to estimate releases from non-point sources; and
- Identifying patterns in data quality issues to focus improvement of reporting assistance. For example, a country may develop guidance materials for sectors or chemicals with a history of data quality issues. A country may also update reporting software to embed guidance or data quality checks for data elements where reporting errors are common.

5 REFERENCES

- Australian Government Department of the Environment (2014), For Teachers and Students, www.npi.gov.au/teachers-students, accessed 29 July 2014.
- Australian Government Department of Sustainability, Environment, Water, Population and Communities (2012), *National Pollutant Inventory Guide, Version 5.3*, Australian Government, Canberra, www.npi.gov.au/sites/www.npi.gov.au/files/resources/2e4b4a22-ae4f-4254-55a2-e0098b016897/files/npiguide.pdf.
- CEC (Commission for Environmental Cooperation) (2005), *Action Plan to Enhance the Comparability of Pollutant Release and Transfer Registers in North America*, CEC, Montreal, www3.cec.org/islandora/en/item/2234-action-plan-enhance-comparability-pollutant-release-and-transfer-registers-in-en.pdf.
- CEC (2014a), Tracking Pollutant Releases and Transfers in North America, www.cec.org/Page.asp?PageID=122&ContentID=25413&SiteNodeID=1228&BL_ExpandID=&AA_SiteLanguageID=1, accessed 19 August 2014.
- CEC (2014b), Taking Stock Online, www.cec.org/Page.asp?PageID=751&ContentID=&SiteNodeID=1097&BL_ExpandID=&AA_SiteLanguageID=1, accessed 5 August 2014.
- EEA (European Environment Agency) (2009), E-PRTR, <http://prtr.ec.europa.eu/Home.aspx>, accessed 5 August 2014.
- Environment Canada (2014), Annual Guide for Reporting to the National Pollutant Release Inventory, Environment Canada, Gatineau, www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=AFC98B81-1, accessed 19 November 2014.
- European Commission (2006), *Guidance Document for the Implementation of the European PRTR*, http://prtr.ec.europa.eu/docs/EN_E-PRTR_fin.pdf.
- GEF (Global Environment Facility) (2008), *United Nations Environment Programme Global Environment Facility (GEF) Project Document*, GEF, Geneva, www.thegef.org/gef/sites/thegef.org/files/gef_prj_docs/GEFProjectDocuments/POPs/MSP%20Folder%20-%20POPs/Global%20-%20POPs%20Monitoring%20Reporting%20and%20Information%20dissemination%20using%20PRTRs/PRTR_prodoc_28-08-2008.pdf.
- GEF (2013), Global Environment Facility: Investing in Our Planet, www.thegef.org/gef/, accessed 5 August 2014.
- Government of Japan, Ministry of the Environment, Ministry of Economy, Trade and Industry (2001), *Outline of the Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the*

Environment and Promotion of Improvements to the Management Thereof,
www.env.go.jp/en/chemi/prtr/documents/pdf/outline_of_the_Act.pdf.

Government of Spain, Ministry of Agriculture, Food and Environment (2014), PRTR-España,
www.en.prtr-es.es, accessed 31 December 2014.

Government of Spain, Ministry of Agriculture, Food and Environment (2014), *Application, use and presentation of PRTR data in the Spanish Register of Emissions and Pollutant Sources*, PRTR-España, Madrid.

OECD (Organisation for Economic Co-operation and Development) (1996), *Pollutant Release and Transfer Registers (PRTRs): A Tool for Environmental Policy and Sustainable Development - Guidance Manual for Governments*, OECD/GD(96)32, OECD, Paris,
<http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=ocde/gd%2896%2932&doclanguage=en>.

OECD (2000), *Presentation and Dissemination of PRTR Data: Practices and Experiences - Getting the Words and Numbers Out*, ENV/JM/MONO(2000)17, Series on Pollutant Release and Transfer Registers, No. 3, OECD, Paris,
<http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282000%2917&doclanguage=en>.

OECD (2003a), Recommendation of the Council on Implementing Pollutant Release and Transfer Registers 1996 [amended on 28 May 2003 - C(2003)87],
<http://acts.oecd.org/Instruments/ShowInstrumentView.aspx?InstrumentID=44&InstrumentPID=41&Lang=en&Book=False>.

OECD (2003b), *Resource Compendium of PRTR Release Estimation Techniques - Part 2: Summary of Diffuse Source Techniques*, ENV/JM/MONO(2003)14, Series on Pollutant Release and Transfer Registers, No. 6, OECD, Paris,
<http://search.oecd.org/officialdocuments/displaydocumentpdf/?doclanguage=en&cote=env/jm/mono%282003%2914>.¹²

OECD (2005a), *Pollutant Release and Transfer Registers: Framework for Selecting and Applying PRTR Release Estimation Techniques*, ENV/JM/MONO(2005)18, Series on Pollutant Release and Transfer Registers, No. 9, OECD, Paris,
<http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282005%2918&doclanguage=en>.

OECD (2005b), *Resource Compendium of PRTR Release Estimation Techniques - Part 3: Summary Of Techniques For Off-Site Transfers*, ENV/JM/MONO(2005)9, Series on Pollutant Release and Transfer Registers, No. 8, OECD, Paris,
<http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282005%299&doclanguage=en>.

OECD (2005c), *Uses of Pollutant Release and Transfer Register Data and Tools for their Presentation: A Reference Manual*, ENV/JM/MONO(2005)3, Series on Pollutant Release and Transfer Registers, No. 7, OECD, Paris,

¹² Note: this reference will be updated following revision of the Resource Compendium.

<http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282005%293&doctlanguage=en>.

OECD (2008a), *Considerations for Ensuring Quality PRTR Data*, ENV/JM/MONO(2008)11, Series on Pollutant Release and Transfer Registers, No. 11, OECD, Paris, <http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282008%2911&doctlanguage=en>.

OECD (2008b), *Scoping Study on the Inclusion of Releases and Transfers from Small and Medium-sized Enterprises (SMEs) in PRTRs*, ENV/JM/MONO(2008)5, Series on Pollutant Release and Transfer Registers, No. 10, OECD, Paris, <http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282008%295&doctlanguage=en>.

OECD (2009). *Ensuring Environmental Compliance: Trends and Good Practices*, OECD, Paris, <http://browse.oecdbookshop.org/oecd/pdfs/product/9709031e.pdf>.

OECD (2011a), *Resource Compendium of PRTR Release Estimation Techniques, Part 4: Summary of Techniques for Releases from Products, Version 1.0*, ENV/JM/MONO(2011)7/PART1, Series on Pollutant Release and Transfer Registers, No. 12, OECD, Paris, <http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282011%297/part1&doctlanguage=en>.

OECD (2011b), *Resource Compendium of PRTR Release Estimation Techniques, Part 4: Summary of Techniques for Releases from Products, Version 1.0*, ENV/JM/MONO(2011)7/PART2, Series on Pollutant Release and Transfer Registers, No. 12, OECD, Paris, <http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282011%297/part2&doctlanguage=en>.

OECD (2013a), *Application, Use and Presentation of Pollutant Release and Transfer Registers (PRTR) Data*, ENV/JM/MONO(2013)1, Series on Pollutant Release and Transfer Registers, No. 14, OECD, Paris, [www.oecd.org/officialdocuments/displaydocument/?cote=env/jm/mono\(2013\)1&doctlanguage=en](http://www.oecd.org/officialdocuments/displaydocument/?cote=env/jm/mono(2013)1&doctlanguage=en).

OECD (2013b), *Revision 1 Of The Resource Compendium of PRTR Release Estimation Techniques - Part 1: Summary of Point Source Techniques*, ENV/JM/MONO(2002)20/REV1, Series on Pollutant Release and Transfer Registers, No. 5, OECD, Paris, <http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282002%2920/rev1&doctlanguage=en>.

OECD (2013c), Resource Centre for PRTR Release Estimation Techniques (RETs), OECD, Paris, www.oecd.org/env/prtr/rc.

OECD (2014a), *Guidance on Elements of a PRTR: Part I*, ENV/JM/MONO(2014)33, Series on Pollutant Release and Transfer Registers, No. 17, OECD, Paris, www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=env/jm/mono%282014%2933&doctlanguage=en.

OECD (2014b), Pollutant Release and Transfer Register, OECD, Paris, www.oecd.org/env/ehs/pollutant-release-transfer-register/.

- OECD (2014c), Centre for PRTR Data, www2.env.go.jp/chemi/prtr/prtrdata/prtr/localstart.php, accessed 5 August 2014.
- OECD, UNECE (United Nations Economic Commission for Europe), and UNEP (United Nations Environment Programme) (2014a), PRTR.net, UNECE, Geneva, www.prtr.net.
- OECD, UNECE, and UNEP (2014b), Implementation, UNECE, Geneva, www.prtr.net/en/implementation/.
- Ulloa, M. (2013), *Pollutant Release and Transfer Register in Chile: How PRTRs could function as a single window for environmental reporting and compliance with international standards*, UNECE, Geneva, www.unece.org/fileadmin/DAM/env/pp/PRTR%20Bureau/GRT2013-Item2-3-Chile_How_PRTRs_could_function_as_a_single_window_for_environmental_reporting.pdf.
- UNECE (2009), Origins and Objective of the new International Pollutant Release and Transfer Registers (PRTR) Coordinating Group, UNECE, Geneva, www.unece.org/env/pp/prtr/intlimages/about.html.
- UNECE (2012a), *Results of Surveys on Protocol on Pollutant Release and Transfer Registers*, ECE/MP.PRTR/WG.1/2012/5, UNECE, Geneva, www.unece.org/fileadmin/DAM/env/pp/prtr/WGP-2/ECE.MP.PRTR.WG.1.2012.5-final-1Nov.pdf.
- UNECE (2012b), *Pollutant Release and Transfer Registers: Matching Needs with Available Expertise*, PRTR/WG.1/2012/Inf.5, www.unece.org/fileadmin/DAM/env/pp/prtr/WGP-2/Note-bilateral-session-Inf-5.En.pdf.
- UNECE (2012c), *PRTRs Advancing Sustainability, Environmental Governance and a Green Economy*, UNECE, Geneva, www.unece.org/fileadmin/DAM/env/pp/prtr/docs/2012/PRTR_brochure_-_13_june_-_EN_colour.pdf.
- UNECE (2014a), Introducing UN/EDIFACT, www.unece.org/trade/untdid/welcome.html accessed 4 August 2014.
- UNECE (2014b), PRTR Guidance Document, UNECE, Geneva, www.unece.org/env/pp/prtr.guidancedev.html, accessed 29 December 2014.
- UNECE (2014c), PRTR Cost Model, UNECE, Geneva, www.unece.org/environmental-policy/treaties/public-participation/protocol-on-prtrs/areas-of-work/envppprtrcb/prtr-cost-model.html, accessed 29 December, 2014.
- UNEP (2008), *Strategic Approach to International Chemicals Management*, UNEP, Geneva, www.saicm.org/images/saicm_documents/Publications/SAICM%20Information%20Bulletin%20No%201%20Jan%202008.pdf.
- UNEP (2011), *Small Island Developing States*, UNEP, Geneva, www.unep.org/ecosystemmanagement/Portals/7/Documents/factsheets/SIDS%20FactSheet%20web.pdf.
- UNITAR (United Nations Institute for Training and Research) (2013), Chile publishes PRTR Regulation, UNITAR, Geneva, <http://prtr.unitar.org/en/latest-news/67-chile-publishes-prtr-regulation>, accessed 1 August 2014.
- UNITAR (2014a), PRTR Learn, UNITAR, Geneva, <http://prtr.unitar.org/>, accessed 5 August 2014.

- UNITAR (2014b), Pollutant Release and Transfer Registers, UNITAR, Geneva, www.unitar.org/cwm/prtr.
- UNITAR and IOMC (Inter-Organization Programme for the Sound Management of Chemicals) (1997a), *Implementing a National PRTR Design Project: A Guidance Document*, UNITAR Guidance Series for Implementing a National PRTR Design Project, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/prtr/pdf/cat3/prtrgd.pdf.
- UNITAR and IOMC (1997b), *Preparing a National PRTR Infrastructure Assessment*, UNITAR Guidance Series for Implementing a National PRTR Design Project, Supplement 1, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/prtr/pdf/cat3/prtr1.pdf.
- UNITAR and IOMC (1997c), *Implementing a PRTR Pilot Reporting Trial*, UNITAR Guidance Series for Implementing a National PRTR Design Project, Supplement 3, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/prtr/pdf/cat3/prtr3.pdf.
- UNITAR and IOMC (1997d), *Structuring a National PRTR Proposal*, UNITAR Guidance Series for Implementing a National PRTR Design Project, Supplement 4, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/synergy/pdf/cat2/prtr/prtr4.PDF.
- UNITAR and IOMC (1997e), *Designing the Key Features of a National PRTR System*, UNITAR Guidance Series for Implementing a National PRTR Design Project, Supplement 2, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/prtr/pdf/cat3/prtr2.pdf.
- UNITAR and IOMC (1998a), *Addressing Industry Concerns Related to PRTRs*, UNITAR Series of PRTR Technical Support Materials, No. 1, UNITAR, Geneva, www2.unitar.org/cwm/publications/cw/prtr/prtr_en/prtr_tech_support_1_nov2003.pdf.
- UNITAR and IOMC (1998b), *Guidance on Estimating Non-point Source Emissions*, UNITAR Series of PRTR Technical Support Materials, No. 3, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/prtr/pdf/cat5/sprtr3.pdf.
- UNITAR and IOMC (1998c), *Guidance for Facilities on PRTR Data Estimation and Reporting*, UNITAR Series of PRTR Technical Support Materials, No. 2, UNITAR, Geneva, www2.unitar.org/cwm/publications/cw/prtr/prtr_en/prtr_tech_support_2_nov2003.pdf.
- UNITAR, UNEP, and GEF (2009), *First Meeting of the Steering Committee for the GEF Medium-sized project on "POPs Monitoring, Reporting and Information Dissemination using Pollutant Release and Transfer Registers (PRTRs)"*, www2.unitar.org/cwm/publications/event/prtr_2009/Meeting_Documents_Doc_5_EN.pdf.
- U.S. EPA (United States Environmental Protection Agency) (2013), *The Toxics Release Inventory in Action: Media, Government, Business, Community and Academic Uses of TRI Data*, U.S. EPA, Washington, www2.epa.gov/sites/production/files/documents/tri_in_action_final_report_july_2013.pdf
- U.S. EPA (2014a), *Toxic Chemical Release Inventory Reporting Forms and Instructions Revised 2013 Version*, EPA 260-R-13-001, U.S. EPA, Washington, www2.epa.gov/sites/production/files/2014-02/documents/rfi_ry2013_120413.pdf.
- U.S. EPA (2014b), *TRI University Challenge Archive*, www2.epa.gov/toxics-release-inventory-tri-program/tri-university-challenge-archive, accessed 4 August 2014.

ANNEX A SUPPORT MATERIALS

Table 2. Table A.1 Supporting Material for PRTR Initiation

Resource	Explanation
<i>Organizing Support from Legislative Bodies, Industry, and the Public</i>	
OECD (2003a), Recommendation of the Council on Implementing Pollutant Release and Transfer Registers 1996 [amended on 28 May 2003 - C(2003)87], http://acts.oecd.org/Instruments/ShowInstrumentView.aspx?InstrumentID=44&InstrumentPID=41&Lang=en&Book=False .	Highlights co-operation between governments and affected and interested parties (Principle #3).
OECD, UNECE, UNEP (2014a), PRTR.net, www.prtr.net/ .	Provides details on the benefits of PRTRs for government, industry, and other parties (Home, About PRTR).
UNITAR and IOMC (1997a), Implementing a National PRTR Design Project: A Guidance Document, UNITAR Guidance Series for Implementing a National PRTR Design Project, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/prtr/pdf/cat3/prtrgd.pdf .	Provides suggestions for organizing a national PRTR design project with the active involvement of all concerned parties (Part B).
UNITAR and IOMC (1998a), Addressing Industry Concerns Related to PRTRs, UNITAR Series of PRTR Technical Support Materials, No. 1, UNITAR, Geneva, www2.unitar.org/cwm/publications/cw/prtr/prtr_en/prtr_tech_support_1_nov2003.pdf .	Presents information relevant to organizing support from industry, including common industry concerns relevant to PRTRs and actions to minimize these concerns (full document).
<i>Identify the Goals for the PRTR System</i>	
OECD (1996), Pollutant Release and Transfer Registers (PRTRs): A Tool for Environmental Policy and Sustainable Development - Guidance Manual for Governments, OECD/GD(96)32, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=ocde/gd%2896%2932&doclanguage=en .	Discusses the process for setting goals (Chapter 2, Section I).
UNITAR and IOMC (1997a), Implementing a National PRTR Design Project: A Guidance Document, UNITAR Guidance Series for Implementing a National PRTR Design Project, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/prtr/pdf/cat3/prtrgd.pdf .	Provides an overview for identifying goals including suggested tasks, key considerations, and outputs (Part C, Section 2).
<i>Infrastructure Assessment</i>	
UNITAR and IOMC (1997a), Implementing a National PRTR Design Project: A Guidance Document, UNITAR Guidance Series for Implementing a National PRTR Design Project, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/prtr/pdf/cat3/prtrgd.pdf .	Provides an overview for assessing infrastructure, including suggested tasks, key considerations, and outputs (Part C, Section 2).

UNITAR and IOMC (1997b), Preparing a National PRTR Infrastructure Assessment, UNITAR Guidance Series for Implementing a National PRTR Design Project, Supplement 1, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/prtr/pdf/cat3/prtr1.pdf .	Provides in-depth guidance on preparing a national PRTR infrastructure assessment (full document).
UNECE (2014b), PRTR Guidance Document, UNECE, Geneva, www.unece.org/env/pp/prtr.guidancedev.html .	Provides guidance for countries implementing a PRTR under the Protocol on PRTRs
<i>Designing a PRTR</i>	
CEC (2005), Action Plan to Enhance the Comparability of Pollutant Release and Transfer Registers in North America, CEC, Montreal, www3.cec.org/islandora/en/item/2234-action-plan-enhance-comparability-pollutant-release-and-transfer-registers-in-en.pdf .	Provides a framework for countries to address differences between the national PRTR programs and to take steps to increase comparability (full document).
OECD (1996), Pollutant Release and Transfer Registers (PRTRs): A Tool for Environmental Policy and Sustainable Development - Guidance Manual for Governments, OECD/GD(96)32, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=ocde/gd%2896%2932&doclanguage=en .	Presents options for developing a PRTR system relevant to PRTR design (full document).
OECD (2003a), Recommendation of the Council on Implementing Pollutant Release and Transfer Registers 1996 [amended on 28 May 2003 - C(2003)87], http://acts.oecd.org/Instruments/ShowInstrumentView.aspx?InstrumentID=44&InstrumentPID=41&Lang=en&Book=False .	Highlights core elements and principles concerning establishment of PRTR systems (full document).
OECD (2014), Guidance on Elements of a PRTR: Part I, ENV/JM/MONO(2014)33, Series on Pollutant Release and Transfer Registers, No. 17, OECD, Paris, www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=env/jm/mono%282014%2933&doclanguage=en .	Provides guidance on designing elements of a PRTR so a PRTR is harmonised with other PRTR systems (full document).
UNITAR and IOMC (1997a), Implementing a National PRTR Design Project: A Guidance Document, UNITAR Guidance Series for Implementing a National PRTR Design Project, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/prtr/pdf/cat3/prtrgd.pdf .	Provides an overview for designing the key features of a National PRTR system, including suggested tasks, key considerations, and outputs (Part C, Section 3).
UNITAR and IOMC (1997e), Designing the Key Features of a National PRTR System, UNITAR Guidance Series for Implementing a National PRTR Design Project, Supplement 2, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/prtr/pdf/cat3/prtr2.pdf .	Provides guidance on designing the key features of a PRTR system (full document).
UNECE (2014b), PRTR Guidance Document, UNECE, Geneva, www.unece.org/env/pp/prtr.guidancedev.html .	Provides guidance for countries implementing a PRTR under the Protocol on PRTRs

<i>Implementing a PRTR Pilot</i>	
OECD (1996), Pollutant Release and Transfer Registers (PRTRs): A Tool for Environmental Policy and Sustainable Development - Guidance Manual for Governments, OECD/GD(96)32, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=ocde/gd%2896%2932&doclanguage=en .	Provides guidance and lessons learned regarding PRTR test studies (Chapter 3, Section VI).
UNITAR and IOMC (1997a), Implementing a National PRTR Design Project: A Guidance Document, UNITAR Guidance Series for Implementing a National PRTR Design Project, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/prtr/pdf/cat3/prtrgd.pdf .	Provides an overview for conducting a PRTR pilot reporting trial, including suggested tasks, key considerations, and outputs (Part C, Section 4).
UNITAR and IOMC (1997c), Implementing a PRTR Pilot Reporting Trial, UNITAR Guidance Series for Implementing a National PRTR Design Project, Supplement 3, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/prtr/pdf/cat3/prtr3.pdf .	Provides in-depth guidance on implementing a PRTR reporting trial (full document).
UNECE (2014b), PRTR Guidance Document, UNECE, Geneva, www.unece.org/env/pp/prtr.guidancedev.html .	Provides guidance for countries implementing a PRTR under the Protocol on PRTRs
<i>Developing a PRTR Proposal</i>	
UNITAR and IOMC (1997a), Implementing a National PRTR Design Project: A Guidance Document, UNITAR Guidance Series for Implementing a National PRTR Design Project, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/prtr/pdf/cat3/prtrgd.pdf .	Provides an overview for finalizing the national PRTR proposal, including suggested tasks, key considerations, and outputs (Part C, Section 5).
UNITAR and IOMC (1997d), Structuring a National PRTR Proposal, UNITAR Guidance Series for Implementing a National PRTR Design Project, Supplement 4, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/synergy/pdf/cat2/prtr/prtr4.PDF .	Provides in-depth guidance on structuring a national PRTR proposal (full document).
<i>Providing Reporting Assistance for Regulated Entities</i>	
OECD (1996), Pollutant Release and Transfer Registers (PRTRs): A Tool for Environmental Policy and Sustainable Development - Guidance Manual for Governments, OECD/GD(96)32, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=ocde/gd%2896%2932&doclanguage=en .	Discusses providing assistance to reporting facilities within guidance for PRTR initiation (Chapter 3, Section VI).
OECD (2008a), Considerations for Ensuring Quality PRTR Data, ENV/JM/MONO(2008)11, Series on Pollutant Release and Transfer Registers, No. 11, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282008%2911&doclanguage=en .	Discusses the effects of training and outreach activities on data quality (Chapter 5).
OECD, UNECE, UNEP (2014a), PRTR.net, www.prtr.net/ .	Provides links to reporting instructions and focused guidance documents developed for various PRTRs (Documents).

<p>UNITAR and IOMC (1997e), Designing the Key Features of a National PRTR System, UNITAR Guidance Series for Implementing a National PRTR Design Project, Supplement 2, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/prtr/pdf/cat3/prtr2.pdf.</p>	<p>Provides guidance on designing the key features of a PRTR system including a discussion of compliance assistance within designing data collection and management procedures (Section 4).</p>
<p>UNITAR and IOMC (1998c), Guidance for Facilities on PRTR Data Estimation and Reporting, UNITAR Series of PRTR Technical Support Materials, No. 2, UNITAR, Geneva, www2.unitar.org/cwm/publications/cw/prtr/prtr_en/prtr_tech_support_2_nov2003.pdf.</p>	<p>Presents guidance on PRTR data estimation and reporting for facilities (full document).</p>
<i>Release Estimation Techniques</i>	
<p>OECD (2005a), Pollutant Release and Transfer Registers: Framework for Selecting and Applying PRTR Release Estimation Techniques, ENV/JM/MONO(2005)18, Series on Pollutant Release and Transfer Registers, No. 9, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282005%2918&doclanguage=en.</p>	<p>Provides a framework for selecting release estimation techniques including information on i) the general principles for producing release data; and ii) the selection and application of the various release estimation techniques to different industrial sectors (full document).</p>
<p>OECD (2003b), Resource Compendium of PRTR Release Estimation Techniques - Part 2: Summary of Diffuse Source Techniques, ENV/JM/MONO(2003)14, Series on Pollutant Release and Transfer Registers, No. 6, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?doclanguage=en&cote=env/jm/mono%282003%2914.</p>	<p>Presents a compilation of release estimation techniques for releases from diffuse sources (full document).</p>
<p>OECD (2005b), Resource Compendium of PRTR Release Estimation Techniques - Part 3: Summary Of Techniques For Off-Site Transfers, ENV/JM/MONO(2005)9, Series on Pollutant Release and Transfer Registers, No. 8, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282005%299&doclanguage=en.</p>	<p>Presents a compilation of release estimation techniques for off-site transfers (full document).</p>
<p>OECD (2008a), Considerations for Ensuring Quality PRTR Data, ENV/JM/MONO(2008)11, Series on Pollutant Release and Transfer Registers, No. 11, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282008%2911&doclanguage=en.</p>	<p>Discusses how various PRTRs have specified estimation of emissions in PRTR system requirements (Section 4.3).</p>
<p>OECD (2011a), Resource Compendium of PRTR Release Estimation Techniques, Part 4: Summary of Techniques for Releases from Products, Version 1.0, ENV/JM/MONO(2011)7/PART1, Series on Pollutant Release and Transfer Registers, No. 12, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282011%297/part1&doclanguage=en.</p>	<p>Presents a compilation of release estimation techniques for releases from products (full document).</p>

<p>OECD (2011b), Resource Compendium of PRTR Release Estimation Techniques, Part 4: Summary of Techniques for Releases from Products, Version 1.0, ENV/JM/MONO(2011)7/PART2, Series on Pollutant Release and Transfer Registers, No. 12, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282011%297/part2&doclanguage=en.</p>	<p>Presents a compilation of release estimation techniques for releases from products (full document).</p>
<p>OECD (2013b), Revision 1 Of The Resource Compendium of PRTR Release Estimation Techniques - Part 1: Summary of Point Source Techniques, ENV/JM/MONO(2002)20/REV1, Series on Pollutant Release and Transfer Registers, No. 5, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282002%2920/rev1&doclanguage=en.</p>	<p>Presents a compilation of release estimation techniques for releases from point sources (full document).</p>
<p>OECD (2013c), Resource Centre for PRTR Release Estimation Techniques (RETs), OECD, Paris, www.oecd.org/env/prtr/rc.</p>	<p>Provides access to release estimation guidance manuals and documents (full site).</p>
<p>OECD (2014), Guidance on Elements of a PRTR: Part I, ENV/JM/MONO(2014)33, Series on Pollutant Release and Transfer Registers, No. 17, OECD, Paris, www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=env/jm/mono%282014%2933&doclanguage=en.</p>	<p>Provides guidance on application of release estimation techniques so a PRTR is harmonised with other PRTR systems (Section 2.3).</p>
<p>UNITAR and IOMC (1997e), Designing the Key Features of a National PRTR System, UNITAR Guidance Series for Implementing a National PRTR Design Project, Supplement 2, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/prtr/pdf/cat3/prtr2.pdf.</p>	<p>Provides guidance on designing the key features of a PRTR system including development of data estimation techniques (Section 4.6).</p>
<p>UNITAR and IOMC (1998b), Guidance on Estimating Non-point Source Emissions, UNITAR Series of PRTR Technical Support Materials, No. 3, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/prtr/pdf/cat5/sprtr3.pdf.</p>	<p>Presents guidance on estimation emissions from non-point sources (full document).</p>
<p>UNITAR and IOMC (1998c), Guidance for Facilities on PRTR Data Estimation and Reporting, UNITAR Series of PRTR Technical Support Materials, No. 2, UNITAR, Geneva, www2.unitar.org/cwm/publications/cw/prtr/prtr_en/prtr_tech_support_2_nov2003.pdf.</p>	<p>Presents guidance on PRTR data estimation for facilities (full document).</p>
<p><i>Obtaining International Support</i></p>	
<p>GEF (2013), Global Environment Facility: Investing in Our Planet, www.thegef.org/gef/.</p>	<p>The UNEP Global Environment Facility (GEF) provides co-financing to supports monitoring, reporting and information dissemination on persistent organic pollutants (POPs) using PRTRs.</p>
<p>OECD (2014b), Pollutant Release and Transfer Register, OECD, Paris, www.oecd.org/env/ehs/pollutant-release-transfer-register/.</p>	<p>OECD's Task Force on PRTRs provides outreach, including the provision of information and technical support related to PRTRs.</p>

OECD, UNECE, UNEP (2014a), PRTR.net, www.prtr.net/ .	Provides a global portal to PRTR information and activities from countries and organisations around the world to assist countries in the development, implementation and improvement of PRTR programmes.
UNECE (2012) Results of surveys on Protocol on Pollutant Release and Transfer Registers. [ECE/MP.PRTR/WG.1/2012/5], UNECE, Geneva, www.unece.org/fileadmin/DAM/env/pp/prtr/WGP-2/ECE.MP.PRTR.WG.1.2012.5-final-1Nov.pdf .	Presents survey results including countries willing to provide bilateral assistance (Full Document).
UNECE (2009), Origins and Objective of the new International Pollutant Release and Transfer Registers (PRTR) Coordinating Group, UNECE, Geneva, www.unece.org/env/pp/prtr/intlchgimages/about.html .	The International Pollutant Release and Transfer Registers (PRTR) Coordinating Group promotes capacity-building for PRTR systems in developing countries and countries with economies in transition through intergovernmental coordination.
UNEP (2008), Strategic Approach to International Chemicals Management, UNEP, Geneva, www.saicm.org/images/saicm_documents/Publications/SAICM%20Information%20Bulletin%20No%201%20Jan%202008.pdf .	The Strategic Approach to International Chemicals Management (SAICM) Quick Start Programme provides support for initial enabling activities in developing countries, least developed countries, small island developing States and countries with economies in transition.
UNITAR (2014a), PRTR Learn, UNITAR, Geneva, http://prtr.unitar.org/ .	Shares insights, information, knowledge and resources on PRTRs.
UNITAR (2014b), Pollutant Release and Transfer Registers, UNITAR, Geneva, www.unitar.org/cwm/prtr .	UNITAR's PRTR Programme, in cooperation with OECD and UNEP Chemicals, assists countries in the design of national PRTRs.
UNITAR and IOMC (1997b), Preparing a National PRTR Infrastructure Assessment, UNITAR Guidance Series for Implementing a National PRTR Design Project, Supplement 1, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/prtr/pdf/cat3/prtr1.pdf .	Discusses Programmes Conducted with Support of International and Bi-lateral Organizations Relevant to a National PRTR (Section 4.V).

<p>UNITAR, UNEP, and GEF (2009), First Meeting of the Steering Committee for the GEF Medium-sized project on “POPs Monitoring, Reporting and Information Dissemination using Pollutant Release and Transfer Registers (PRTRs)”, www2.unitar.org/cwm/publications/event/prtr_2009/Meeting_Documents_Doc_5_EN.pdf.</p>	<p>Provides an overview of the synergies that are being undertaken in PRTR capacity-building activities within the Project “POPs monitoring, reporting and information dissemination using Pollutant Release and Transfer Registers (PRTRs)”</p>
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Table A.2. Support Materials for PRTR Operation	
Resource	Explanation
<i>Staffing/Governance</i>	
UNITAR and IOMC (1997e), Designing the Key Features of a National PRTR System, UNITAR Guidance Series for Implementing a National PRTR Design Project, Supplement 2, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/prtr/pdf/cat3/prtr2.pdf .	Provides guidance on designing the key features of a PRTR system including development of data estimation techniques (Section 4.6).
<i>Reporting Software</i>	
OECD (1996), Pollutant Release and Transfer Registers (PRTRs): A Tool for Environmental Policy and Sustainable Development - Guidance Manual for Governments, OECD/GD(96)32, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=ocde/gd%2896%2932&doclanguage=en .	Discusses reporting software used by various PRTRs (Chapter 3).
OECD (2008a), Considerations for Ensuring Quality PRTR Data, ENV/JM/MONO(2008)11, Series on Pollutant Release and Transfer Registers, No. 11, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282008%2911&doclanguage=en .	Discusses use of reporting software and effects on PRTR data quality (Chapter 6).
OECD, UNECE, UNEP (2014b), Implementation, UNECE, Geneva, www.prtr.net/en/implementation/ .	Provides links to open source database software that may be adapted for reuse by other countries.
UNITAR and IOMC (1997e), Designing the Key Features of a National PRTR System, UNITAR Guidance Series for Implementing a National PRTR Design Project, Supplement 2, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/prtr/pdf/cat3/prtr2.pdf .	Provides guidance on designing the key features of a PRTR system including development of reporting software (Section 4.2).
<i>Estimating Releases from Non-point Sources</i>	
OECD (2003b), Resource Compendium of PRTR Release Estimation Techniques - Part 2: Summary of Diffuse Source Techniques, ENV/JM/MONO(2003)14, Series on Pollutant Release and Transfer Registers, No. 6, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?doclanguage=en&cote=env/jm/mono%282003%2914 .	Presents a compilation of release estimation techniques for releases from diffuse sources (full document).

<p>OECD (2005a), Pollutant Release and Transfer Registers: Framework for Selecting and Applying PRTR Release Estimation Techniques, ENV/JM/MONO(2005)18, Series on Pollutant Release and Transfer Registers, No. 9, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282005%2918&doclanguage=en.</p>	<p>Provides a framework for selecting release estimation techniques including information on i) the general principles for producing release data; and ii) the selection and application of the various release estimation techniques to different industrial sectors (full document).</p>
<p>OECD (2008b), Scoping Study on the Inclusion of Releases and Transfers from Small and Medium-sized Enterprises (SMEs) in PRTRs, ENV/JM/MONO(2008)5, Series on Pollutant Release and Transfer Registers, No. 10, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282008%295&doclanguage=en.</p>	<p>Provides guidance on the types of small and medium sized enterprises that might be included in PRTRs as diffuse sources (full document).</p>
<p>OECD (2011a), Resource Compendium of PRTR Release Estimation Techniques, Part 4: Summary of Techniques for Releases from Products, Version 1.0, ENV/JM/MONO(2011)7/PART1, Series on Pollutant Release and Transfer Registers, No. 12, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282011%297/part1&doclanguage=en.</p>	<p>Presents a compilation of release estimation techniques for releases from products (full document).</p>
<p>OECD (2011b), Resource Compendium of PRTR Release Estimation Techniques, Part 4: Summary of Techniques for Releases from Products, Version 1.0, ENV/JM/MONO(2011)7/PART2, Series on Pollutant Release and Transfer Registers, No. 12, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282011%297/part2&doclanguage=en.</p>	<p>Presents a compilation of release estimation techniques for releases from products (full document).</p>
<p>UNITAR and IOMC (1997e), Designing the Key Features of a National PRTR System, UNITAR Guidance Series for Implementing a National PRTR Design Project, Supplement 2, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/prtr/pdf/cat3/prtr2.pdf.</p>	<p>Provides guidance on designing the key features of a PRTR system including development of data estimation techniques (Section 4.6).</p>
<p>UNITAR and IOMC (1998b), Guidance on Estimating Non-point Source Emissions, UNITAR Series of PRTR Technical Support Materials, No. 3, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/prtr/pdf/cat5/sprtr3.pdf.</p>	<p>Presents guidance on estimation emissions from non-point sources (full document).</p>
<i>Data Processing, IT Infrastructure and Database</i>	
<p>OECD (1996), Pollutant Release and Transfer Registers (PRTRs): A Tool for Environmental Policy and Sustainable Development - Guidance Manual for Governments, OECD/GD(96)32, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=ocde/gd%2896%2932&doclanguage=en.</p>	<p>Provides guidance regarding PRTR data processing (Chapter 3).</p>
<p>OECD, UNECE, UNEP (2014b), Implementation, UNECE, Geneva, www.prtr.net/en/implementation/.</p>	<p>Provides links to open source database software that may be adapted for reuse by other countries.</p>

UNECE (2014a), Introducing UN/EDIFACT, www.unece.org/trade/untdid/welcome.html .	Provides information on UN Electronic Data Interchange (EDI) standards that may be useful for harmonising PRTR data collection, compilation, and storage.
UNITAR and IOMC (1997e), Designing the Key Features of a National PRTR System, UNITAR Guidance Series for Implementing a National PRTR Design Project, Supplement 2, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/prtr/pdf/cat3/prtr2.pdf .	Provides guidance on designing the key features of a PRTR system including data collection and management procedures (Section 4).
<i>Data Quality Assurance</i>	
OECD (1996), Pollutant Release and Transfer Registers (PRTRs): A Tool for Environmental Policy and Sustainable Development - Guidance Manual for Governments, OECD/GD(96)32, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=ocde/gd%2896%2932&doclanguage=en .	Provides guidance regarding PRTR data quality (Chapter 3, Section 2).
OECD (2008a), Considerations for Ensuring Quality PRTR Data, ENV/JM/MONO(2008)11, Series on Pollutant Release and Transfer Registers, No. 11, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282008%2911&doclanguage=en .	Presents considerations for ensuring quality PRTR data (full document).
UNITAR and IOMC (1997e), Designing the Key Features of a National PRTR System, UNITAR Guidance Series for Implementing a National PRTR Design Project, Supplement 2, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/prtr/pdf/cat3/prtr2.pdf .	Provides guidance on designing the key features of a PRTR system including data verification (Section 4.7).
<i>Data Dissemination</i>	
CEC (2014), Taking Stock Online, www.cec.org/Page.asp?PageID=751&ContentID=&SiteNodeID=1097&BL_ExpandID=&AA_SiteLanguageID=1 .	This database presents PRTR data for Canada, Mexico, and the U.S.
OECD (1996), Pollutant Release and Transfer Registers (PRTRs): A Tool for Environmental Policy and Sustainable Development - Guidance Manual for Governments, OECD/GD(96)32, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=ocde/gd%2896%2932&doclanguage=en .	Provides guidance on PRTR data dissemination (Chapter 4).
OECD (2000), Presentation and Dissemination of PRTR Data: Practices and Experiences - Getting the Words and Numbers Out, ENV/JM/MONO(2000)17, Series on Pollutant Release and Transfer Registers, No. 3, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282000%2917&doclanguage=en .	Describes ways to present and disseminate PRTR data to the public (full document).
OECD (2003a), Recommendation of the Council on Implementing Pollutant Release and Transfer Registers 1996 [amended on 28 May 2003 - C(2003)87], http://acts.oecd.org/Instruments/ShowInstrumentView.aspx?InstrumentID=44&InstrumentPID=41&Lang=en&Book=False .	Highlights making the results of a PRTR accessible to all affected and interested parties (Principle 9).
OECD (2005c), Uses of Pollutant Release and Transfer Register Data and Tools for their Presentation: A Reference Manual, ENV/JM/MONO(2005)3, Series on Pollutant Release and Transfer	Presents numerous examples of the variety of tools for presenting and illustrating

Registers, No. 7, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282005%293&doclanguage=en .	PRTR data (full document).
OECD (2013a), Application, Use and Presentation of Pollutant Release and Transfer Registers (PRTR) Data, ENV/JM/MONO(2013)1, Series on Pollutant Release and Transfer Registers, No. 14, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282013%291&doclanguage=en .	Presents survey results and inventories PRTR data dissemination tools (full document).
OECD (2014), Guidance on Elements of a PRTR: Part I, ENV/JM/MONO(2014)33, Series on Pollutant Release and Transfer Registers, No. 17, OECD, Paris www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=env/jm/mono%282014%2933&doclanguage=en .	Provides guidance on disseminating PRTR data so a PRTR is harmonised with other PRTR systems (Section 2.5).
OECD (2014c), Centre for PRTR Data, www.oecd.org/env/prtr/data .	This database presents PRTR data from numerous countries.
UNITAR and IOMC (1997a), Implementing a National PRTR Design Project: A Guidance Document, UNITAR Guidance Series for Implementing a National PRTR Design Project, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/prtr/pdf/cat3/prtrgd.pdf .	Discusses developing data analysis and dissemination procedures within section on designing the key features of a national PRTR system (Part C, Section 3).
UNITAR and IOMC (1997e), Designing the Key Features of a National PRTR System, UNITAR Guidance Series for Implementing a National PRTR Design Project, Supplement 2, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/prtr/pdf/cat3/prtr2.pdf .	Provides guidance on designing the key features of a PRTR system including data analysis and dissemination procedures (Section 5).

Table A.3 Support Materials for Long Term Success	
Resource	Explanation
<i>Compliance Assurance</i>	
OECD (2003a), Recommendation of the Council on Implementing Pollutant Release and Transfer Registers 1996 [amended on 28 May 2003 - C(2003)87], http://acts.oecd.org/Instruments/ShowInstrumentView.aspx?InstrumentID=44&InstrumentPID=41&Lang=en&Book=False .	Highlights a compliance mechanism to be agreed by affected and interested parties (Principle 13).
OECD (2008a), Considerations for Ensuring Quality PRTR Data, ENV/JM/MONO(2008)11, Series on Pollutant Release and Transfer Registers, No. 11, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282008%2911&doclanguage=en .	Discusses compliance and enforcement procedures relevant to PRTR data quality and the effects of outreach on PRTR data quality (Section 4.6, Chapter 5).
OECD (2009). Ensuring Environmental Compliance: Trends and Good Practices, OECD, Paris, http://browse.oecdbookshop.org/oecd/pdfs/product/9709031e.pdf	Provides guidance on designing an effective compliance assurance regime for ensuring environmental compliance (Full Document).
UNITAR and IOMC (1997e), Designing the Key Features of a National PRTR System, UNITAR Guidance Series for Implementing a National PRTR Design Project, Supplement 2, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/prtr/pdf/cat3/prtr2.pdf .	Provides guidance on designing the key features of a PRTR system including mechanisms for enforcement, incentives for reporting, and reporting guidance materials (Section 3.3 and 4.5).
<i>Stakeholder Outreach</i>	
OECD (1996), Pollutant Release and Transfer Registers (PRTRs): A Tool for Environmental Policy and Sustainable Development - Guidance Manual for Governments, OECD/GD(96)32, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=ocde/gd%2896%2932&doclanguage=en .	Discusses stakeholder outreach within guidance on PRTR data dissemination (Chapter 4).
OECD (2000), Presentation and Dissemination of PRTR Data: Practices and Experiences - Getting the Words and Numbers Out, ENV/JM/MONO(2000)17, Series on Pollutant Release and Transfer Registers, No. 3, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282000%2917&doclanguage=en .	Discusses marketing and publicity as tools to enhance presentation and dissemination of PRTR data (Section 2.11.1); discusses training and education as tools to enhance presentation and dissemination of PRTR data (Section 2.11.1).
OECD (2013a), Application, Use and Presentation of Pollutant Release and Transfer Registers (PRTR) Data, ENV/JM/MONO(2013)1, Series on Pollutant Release and Transfer Registers, No. 14, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282013%2914&doclanguage=en .	Presents survey results discussing promotion of PRTR data by various PRTRs and presents examples of materials developed to help stakeholders interpret PRTR data (Section 3.2).

<i>Enhancing the PRTR System over Time</i>	
OECD (1996), Pollutant Release and Transfer Registers (PRTRs): A Tool for Environmental Policy and Sustainable Development - Guidance Manual for Governments, OECD/GD(96)32, OECD, Paris, http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=ocde/gd%2896%2932&doclanguage=en .	Provides guidance regarding monitoring and improving PRTR systems (Chapter 5).
OECD (2003a), Recommendation of the Council on Implementing Pollutant Release and Transfer Registers 1996 [amended on 28 May 2003 - C(2003)87], http://acts.oecd.org/Instruments/ShowInstrumentView.aspx?InstrumentID=44&InstrumentPID=41&Lang=en&Book=False .	Highlights allowing for mid-course evaluation and flexibility for change in response to changing needs (Principle 10).
UNECE (2014c), PRTR Cost Model, UNECE, Geneva, www.unece.org/environmental-policy/treaties/public-participation/protocol-on-prtrs/areas-of-work/envppprtrcb/prtr-cost-model.html , accessed 29 December, 2014.	Enables the development of detailed estimates of the magnitude of costs of monitoring emissions (releases) of substances, contained in the annex to the Protocol on PRTRs, to different environmental media (air, water and land) in order to assist Parties to the Protocol with its implementation.
UNITAR and IOMC (1997d), Structuring a National PRTR Proposal, UNITAR Guidance Series for Implementing a National PRTR Design Project, Supplement 4, UNITAR, Geneva, www2.unitar.org/cwm/publications/cbl/synergy/pdf/cat2/prtr/prtr4.PDF .	Discusses including recommendations for further development of PRTR systems within a PRTR proposal (Section 3.10).

ANNEX B. EXAMPLES OF BILATERAL COOPERATION

Project for the Development of Basic Schemes for PRTR System in Kingdom of Thailand				
Project Type	Donor	Recipient	Timeline	Budget
Technical Cooperation	Japan	Thailand	Mar. 1, 2011 to Feb. 28, 2015	200,000,000JPY (2011-2015)
Description:	<ol style="list-style-type: none"> 1. Basic design of PRTR system in Thailand is established; 2. Emission reporting scheme for industry is developed; 3. Capacity of estimation of emission and transfer for point source is strengthened; 4. Capacity of emission estimation for non-point source is strengthened; 5. Importance of use of PRTR data including initial assessment is understood; and 6. Importance of risk communication is understood. 			
Participating Organizations:	<ul style="list-style-type: none"> • Pollution Control Department (PCD), Ministry of Natural Resources and Environment • Department of Industrial Works (DIW), Ministry of Industry • Industrial Estate Authority of Thailand (IEAT), Ministry of Industry 			
Resources:	<p>Japan provides:</p> <ul style="list-style-type: none"> • PRTR training courses • Dispatch of experts in design of PRTR systems, chemical management, point source emission estimation, point source reporting systems, non-point source emission estimation, and social consideration and risk communication <p>Thailand provides:</p> <ul style="list-style-type: none"> • Office space • Necessary local cost for project implementation and counterpart personnel 			
More Information:	Japan International Cooperation Agency (2010), Project for the Development of Basic Schemes for PRTR System in Kingdom of Thailand: Outline of the Project, www.jica.go.jp/project/english/thailand/013/outline/index.html .			

Support to the Israeli Ministry for Environmental Protection in the Establishment and Implementation of a System of Integrated Pollution and Prevention Control (IPPC) and a Pollutant Release and Transfers Register (PRTR)				
Project Type	Donor	Recipient	Timeline	Budget
Twinning-Project of the European Commission	European Commission	Israel; Ministry of Environmental Protection of the State of Israel (MoEP)	May 2013 to Feb 2015	Component PRTR (excluding the component for the IPPC): ca. 50.000€
Description:	<ol style="list-style-type: none"> 1. Analysis of current state of Israel's PRTR 2. Training on the operation and functioning of the PRTR 3. Analysis of Environmental Information System (EIS) and recommendations for improvement/ extension of EIS 			
Participating Organizations:	<ul style="list-style-type: none"> • Ministry of Environmental Protection of the State of Israel (MoEP); representatives of different divisions • District branch of MoEP and representatives of other district branches • Representatives of Israeli Union for Environmental Defense (NGO) • Representatives of Israeli Manufacturers association • Israeli Bureau of Statistics Israeli 			
Resources:	<p>Germany provided:</p> <ul style="list-style-type: none"> • German Project Leader German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) • German Resident Twinning Adviser • Experts from the Federal Environment Agency • Experts from the different Federal states • PRTR training courses <p>Israel provided:</p> <ul style="list-style-type: none"> • Office space • Office equipment • Necessary local cost for project implementation and counterpart personnel 			
More Information:	<p>Twinning Project (En): www.sviva.gov.il/English/env_topics/IndustryAndBusinessLicensing/IntegratedEnvironmentalLicensing/Pages/default.aspx#GovXParagraphTitle6</p> <p>Israeli PRTR (En) www.sviva.gov.il/English/env_topics/IndustryAndBusinessLicensing/PRTR/PRTRReportingInIsrael/Pages/2013-Reports.aspx</p>			

Global Project on the Implementation of PRTRs as a Tool for POPs Reporting, Dissemination and Awareness Raising (Phase II)				
Project Type	Donor	Recipient	Timeline	Budget
Technical Cooperation	GEF/UNEP	Belarus, Cambodia, Ecuador, Kazakhstan, Moldova and Peru	Starting in 2014	See More Information
Description:	To improve access and accuracy of environmental data on POPs and other priority chemicals in 6 countries, and to enhance awareness and public participation on environmental matters, through implementation of fully operational national PRTRs			
Participating Organizations:	<ul style="list-style-type: none"> PRTR-España team (Ministry of Agriculture, Food and Environment of Spain) 			
Resources:	<ul style="list-style-type: none"> Spain will contribute with technical support as required by GEF and recipient countries (mainly Ecuador and Peru). 			
More Information:	More information on the project can be found on the GEF website (project information): www.thegef.org/gef/project_detail?projID=5648			

Electronic PRTR Systems - Using Open Source for Providing Open Data				
Project Type	Donor	Recipient	Timeline	Budget
International Workshop	Germany	Countries from Eastern Europe, Caucasus and Central Asia (EECCA)	29/30 October 2013 in Berlin	78.500,00 €
Description:	<p>The workshop was structured into three blocks:</p> <ul style="list-style-type: none"> • Introduction and background information on implementing the PRTR Protocol and the concept of open source; • Sharing experiences regarding the use of the electronic tools and open source in establishing a PRTR; and • Lessons from developing the PRTR in Germany and overarching perspectives. 			
Participating Organizations:	<ul style="list-style-type: none"> • German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) • German Federal Environment Agency (UBA) • The workshop featured participants from 17 countries, including 9 EECCA countries, and also from UNITAR 			
Resources:	The workshop was funded completely by the German Federal Ministry (including travel expenses for the participants of SEE and EECCA states).			
More Information:	http://prtr-workshop.ecologic-events.eu/			

Study Visit on the PRTR				
Project Type	Donor	Recipient	Timeline	Budget
TAIEX and Study visit	European Commission, organised in cooperation with the German Federal Environment Agency (UBA) and the State office for Environmental Protection of Saxony-Anhalt	Expert from the Ministry of Environment of the former Yugoslav Republic of Macedonia	14.-18. October 2013 in Dessau (UBA)	Funded by the EU
Description:	Further development of skills, knowledge and e-tools in the PRTR and to assure continued improvement and capacity building related to PRTR.			
Participating Organizations:	<ul style="list-style-type: none"> • European Commission • German Federal Environment Agency (UBA) • State office for Environmental Protection of Saxony-Anhalt • Participants of the Ministry of the Environment of the former Yugoslav Republic of Macedonia 			
Resources:	Germany provided: <ul style="list-style-type: none"> • Experts from the Federal Environment Agency (UBA) and from the State office for Environmental Protection of Saxony-Anhalt 			

Capacity Building to Put the Aarhus Convention into Action and to Support the Development of PRTR Systems in SEE Countries				
Project Type	Donor	Recipient	Timeline	Budget
German Federal Environment Ministry's Advisory Assistance Programme (AAP) for Environmental Protection in the Countries of Central and Eastern Europe, the Caucasus and Central Asia	German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU). Project management and technical assistance by the German Federal Environment Agency (UBA)	Concerning PRTR, selected Western Balkan countries were: The former Yugoslav Republic of Macedonia, Serbia, Bosnia, and Herzegovina	April 2011 to October 2013	Component PRTR (excluding component for the Aarhus Convention): ca. 121.000€
Description:	<ol style="list-style-type: none"> 1. To support stakeholders in developing functioning PRTRs 2. Technical assistance and capacity building to support the ratification and implementation of the PRTR Protocol 3. Stakeholder meetings, awareness raising workshops, 4. pilot activities, on-site trainings and elaboration of guidance. 			
Participating Organizations:	<ul style="list-style-type: none"> • German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) • Project management and technical assistance by the German Federal Environment Agency (UBA) <p>Beneficiaries:</p> <ul style="list-style-type: none"> • Ministries and competent authorities • NGOs • Industrial associations • Operators • Pilot facilities 			
Resources:	<ul style="list-style-type: none"> • The international workshop was funded by the German Federal Ministry for the Environment (BMU). • Implementing organisation: The Regional Environmental Center (REC), Hungary 			
More Information:	www.thru.de/thrude/about-thrude/projekte-international/pollutant-registers-in-the-western-balkan-region/?L=3			

Promotion PRTR activities in Central America both at the Regional Level and the Country Level				
Project Type	Donor	Recipient	Timeline	Budget
Financial and technical support	Government of Spain (Ministry of Agriculture, Food and Environment)	Central American Commission for Environment and Development (CCAD) and individual countries (Guatemala, Belize, Costa Rica, Honduras,	2010-2012	Approximately €1,000,000 (see more information)
Description:	<ul style="list-style-type: none"> • Capacity assessment for the implementation of a regional PRTR in Central America; • Concept document of the regional PRTR in Central America; and • PRTR pilot trials in Countries (Belize, Costa Rica, Guatemala and Honduras). 			
Participating Organizations:	<ul style="list-style-type: none"> • CCAD, Spain (Ministry and the PRTR-España team) • Recipient countries • UNITAR 			
Resources:	Spain provided: <ul style="list-style-type: none"> • Financial support for the project • Technical assistance during the whole project at regional level and country level (Belize, Honduras, Guatemala, Costa Rica. Also to Panama Dominican Republic. • Study visits to Spain • Official translation into Spanish of the UNECE Guide on PRTR: www.unece.org/env/pp/prtr.guidancedev.html. 			
More Information:	More information available on www.sica.int/ccad/retce.aspx PRTR Honduras: www.retchn.org/ PRTR Guatemala: www.retcguatemala.com/			

Strategy for the Development of Pollutant Release & Transfer Registries (PRTRs) Analogous to EPA's Toxics Release Inventory (TRI) Program in each Central American Country and the Dominican Republic.				
Project Type	Donor	Recipient	Timeline	Budget
Technical Support and Cooperation	United States	Central America	Circa 2006-2011	Not Available
Description:	In 2008, under a cooperative agreement established under the Dominican Republic - Central American – United States Free Trade Agreement (CAFTA-DR), UNITAR and the US federal government set out to develop a strategy for the development of pollutant release & transfer registries (PRTR) analogous to EPA's Toxics Release Inventory (TRI) Program in each Central American country and the Dominican Republic. The ultimate goal of this effort was the development of a regional PRTR system, composed of the PRTRs in each Central American country and in the Dominican Republic.			
Participating Organizations:	<ul style="list-style-type: none"> • US Environmental Protection Agency • United Nations Institute for Training and Research (UNITAR) • US Agency for International Development 			

POPs Reporting, Monitoring and Information Dissemination using PRTRs (Phase 1)				
Project Type	Donor	Recipient	Timeline	Budget
Technical Cooperation	GEF/UNEP	Cambodia, Ecuador, Kazakhstan, Peru, Ukraine and Chile	2009-2012	See More Information
Description:	<ul style="list-style-type: none"> • Identification of national objectives of the PRTR; • National feasibility study for implementing a PRTR; • Capacities and opportunities for establishing a PRTR at national level; • Developing key features of the national PRTR (comprising the list of PRTR chemicals to be reported - including pops, the list of industrial sectors); • Legal status, administrative structure and data collection procedures of the PRTR; • National executive proposal for the implementation of a PRTR; • Pilot trial of the designed PRTR; • National implementation workshop, when appropriate; and • Partnership activities between Government and ngos to disseminate prtrs among the civil society. 			
Participating Organizations:	<ul style="list-style-type: none"> • PRTR-España team (Ministry of Agriculture, Food and Environment of Spain) 			
Resources:	Spain provides: <ul style="list-style-type: none"> • Technical assistance prior and during the design of national key features and pilot testing of the PRTRs (Ecuador and Peru); • Visit to the countries to facilitate Technical Meetings on discussing the best approach to implement the PRTR; • Study visits of experts from Peru and Ecuador to Spain; and • Several technical materials on Spanish experiences on implementation, application, uses and presentation of PRTR data. 			
More Information:	More information on the project can be found on the GEF website (project information): www.thegef.org/gef/project_detail?projID=3348			

PRTR Development and Implementation in Chile				
Project Type	Donor	Recipient	Timeline	Budget
Technical Cooperation	Canada	Chile	2002 to 2007	N/A
Description:	<ol style="list-style-type: none"> 1. PRTR support activities included in the environmental side-agreement to the Canada-Chile Free Trade Agreement (2007); and 2. Canada contributed PRTR expertise on various occasions, in support of the UNITAR lead PRTR Development Project, through participation in various workshops in Chile and hosting visits of Chilean government officials to Canada (between 2002 and 2007). 			
Participating Organizations:	<ul style="list-style-type: none"> • Ministry of the Environment of Canada • United Nations Institute for Training and Research (UNITAR) • Ministry of the Environment of Chile 			
Resources:	<p>UNITAR provided:</p> <ul style="list-style-type: none"> • Lead for the PRTR Development Project in Chile • PRTR training materials, event coordination, overall project support <p>Canada provided:</p> <ul style="list-style-type: none"> • PRTR expertise from government, industry and civil society perspectives <p>Chile provided:</p> <ul style="list-style-type: none"> • Staff for the PRTR Project • Venues for meetings and event support 			
More Information:	Chile PRTR Website: www.mma.gob.cl/retc_ingles/1316/w3-channel.html			

Cooperative Agreement with the United Nations Institute for Training and Research (UNITAR) for Implementation of a Pollutant Release and Transfer Register (PRTR) Design and Capacity Building Project in Chile				
Project Type	Donor	Recipient	Timeline	Budget
Technical Support and Cooperation	United States	Chile	Circa 2003-2006	Not Available
Description:	The overall goal of the project was to provide assistance to the United Nations Institute for Training and Research (UNITAR) to provide technical and financial support to Chile's National Environment Commission toward implementing specific PRTR design tasks. The final deliverable of the project was a National PRTR Proposal developed through and endorsed by a multi-stakeholder process. The PRTR Design Proposal served as the core document for government decision-makers in Chile responsible for formally institutionalizing a PRTR system.			
Participating Organizations:	<ul style="list-style-type: none"> • US Environmental Protection Agency • United Nations Institute for Training and Research (UNITAR) 			
More Information:	Cooperative Agreement with the United Nations Institute for Training and Research (UNITAR) for Implementation of a Pollutant Release and Transfer Register (PRTR) Design and Capacity Building Project in Chile			

Conference of the Americas on PRTR				
Project Type	Donor	Recipient	Timeline	Budget
Awareness Raising and Capacity-Building	Canada	South and Central American countries	2002 to 2004	N/A
Description:	1) Sub-Regional workshops were held in Costa Rica, Jamaica and Brazil to build awareness of and interest in PRTRs; and 2) A follow-up Conference was held April 21-23, 2004 in Mexico City for all countries of the Americas, to promote PRTRs and discuss options to build capacity to implement PRTRs in countries of South and Central America.			
Participating Organizations:	<ul style="list-style-type: none"> • Ministry of the Environment of Canada • United Nations Institute for Training and Research (UNITAR) • United Nations Environment Programme (UNEP) • Chemistry Industry Association of Canada • Various Canadian Environmental Organizations 			
Resources:	UNEP and UNITAR provided: <ul style="list-style-type: none"> • In-kind contributions • PRTR training materials, event coordination, overall project support Canada provided: <ul style="list-style-type: none"> • Funding and contractor assistance • PRTR expertise from government, industry and civil society perspectives Host countries provided: <ul style="list-style-type: none"> • Venue for meetings and event support 			