MANUAL FOR DESIGNING AND IMPLEMENTING

POLLUTANT RELEASE AND TRANSFER REGISTERS

2017

Ministerio del Medio Ambiente
Gobierno de Chile

PRTR

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MANUAL FOR DESIGNING AND IMPLEMENTING POLLUTANT RELEASE AND TRANSFER REGISTERS (PRTRs):

THE CASE OF CHILE

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ACRONYMS

ASIQUIM: Chemical Industry Trade Association of Chile (*Asociación Gremial de Industriales Químicos de Chile*)
ASRM: Sanitation Authority for the Metropolitan Region (*Autoridad Sanitaria Región Metropolitana*)
CAS: Chemical Abstracts Service (*Division of the American Chemical Society*)
CAS Registry Number: A numeric identifier assigned to chemical substances by the Chemical Abstracts Service.
CASEN: National Socioeconomic Characterization Survey (*Encuesta de Caracterización Socioeconómica Nacional*)
CONAF: National Forestry Corporation (*Corporación Nacional Forestal*)
CONAMA: National Environmental Commission (*Comisión Nacional del Medio Ambiente*)
DIRECTEMAR: General Directorate of Maritime Territory and the Merchant Marine (*Dirección General del Territorio Marítimo y de Marina Mercante*)
EC: Ministry of Environment and Climate Change of Canada
ENIA: Annual National Industry Survey (*Encuesta Nacional Industrial Anual*)
EPCRA: Emergency Planning and Community Right-to-Know Act
EPR: Extended Producer Responsibility
FTA: Free Trade Agreement
GNC: National Coordination Group (*Grupo Nacional Coordinador*)
GPA: Environmental Protection Expenditure (*Gasto en Protección Ambiental*)
INE: National Institute of Statistics (*Instituto Nacional de Estadísticas*)
ISIC: International Standard Industrial Classification of All Economic Activities (*Código Industrial Internacional Uniforme, CIIU*)
LIWs: Liquid Industrial Wastes
LNG: Liquefied Natural Gas
LoW: European List of Waste
MMA: Ministry of the Environment of Chile (*Ministerio del Medio Ambiente*)
MIDEPLAN: Ministry of Planning of Chile (*Ministerio de Planificación*)
MINSAL: Ministry of Health of Chile (*Ministerio de Salud*)
MTT: Ministry of Transportation and Telecommunications of Chile (*Ministerio de Transportes y Telecomunicaciones*)
MODEM: Mobile Source Emission Factor Model (*Metodología para el Cálculo de Emisiones Vehiculares)*
MOP: Ministry of Public Works (*Ministerio de Obras Públicas*)
MINSEGPRES: Ministry General Secretariat of the Presidency (*Ministerio Secretaría General de la Presidencia*)
MR: Metropolitan Region
ODEPA: Office of Agrarian Studies and Policies (*Oficina de Estudios y Políticas Agrarias*)
ODS: Ozone Depleting Substances

OECD: Organisation for Economic Co-operation and Development
PROCOF: SISS Procedure for the Control and Surveillance of LIWs
(*Procedimiento de Control y Fiscalización de RILes de la SISS*)
PRTR: Pollutant Release and Transfer Register
RCA: Environmental Qualification Resolution
(*Resolución de Calificación Ambiental*)
REMA: Annual State of the Environment Report
(*Reporte del Estado del Medio Ambiente*)
RESNOPEL: Non-Hazardous Waste
(*Residuos No Peligrosos*)
RESPEL: Hazardous Waste
(*Residuos Peligrosos*)
SACEI: Self-Control System for Industrial Facilities
(*Sistema de Autocontrol de Establecimientos Industriales*)
SAG: Agriculture and Livestock Service
(*Servicio Agrícola y Ganadero*)
SDGs: Sustainable Development Goals
SECTRA: Transportation Planning Secretariat
(*Secretaría de Planificación de Transporte*)
SEEA: System of Environmental-Economic Accounting
SEIA: Environmental Impact Assessment System
(*Sistema de Evaluación de Impacto Ambiental*)
SEMARNAT: Secretariat of Environment and Natural Resources, Mexico
(*Secretaría del Medio Ambiente y Recursos Naturales, de México*)
SEMAT: Environment and Territory Secretariat, Ministry of Public Works
(*Secretaría de Medio Ambiente y Territorio-MOP*)
SMA: Undersecretariat of the Environment
(*Subsecretaría del Medio Ambiente*)
SICTER: Information System for Thermoelectric Power Plants
(*Sistema de Información de Centrales Termoeléctrica*)
SIDREP: Hazardous Waste Reporting System
(*Sistema de Declaración de Residuos Peligrosos*)
SII: Chilean Internal Revenue Service
(*Servicio de Impuestos Internos*)
SINADER: National Waste Reporting System
(*Sistema Nacional de Declaración de Residuos*)
SISS: Superintendency of Sanitation Services
(*Superintendencia de Servicios Sanitarios*)
SOE: State of the Environment Report
SRPC: System for Reporting Controlled Products
(Sistema de Reporte de Productos Controlados)
TRI: Toxics Release Inventory
UN: United Nations
UNITAR: United Nations Institute for Training and Research
USEPA: United States Environmental Protection Agency
UTR: Unique Tax Reference number
VU: One-Stop Shop
(*Ventanilla Única*)
WS: Web Services

CONTENT

01 FOREWORD

The concern for the environment and the actions taken in terms of environmental management in Chile have evolved significantly over the past 30 years, from the beginning of the first environmental policies and regulations, with the passing of Law N°19.300 on the General Environmental Framework in 1994 and the creation of the National Environment Commission (CONAMA by its acronym in Spanish), until the passing, in 2010, of Law 20.417, which changed the environmental institutional framework of the country, creating the Ministry of the Environment (MMA), the Environmental Assessment Service and the Superintendency of the Environment.

Nevertheless, the economic growth of the country over the last few decades has generated and continues to cause high environmental pollution, mainly in the urban centers. This situation affects the production processes and economic-social infrastructure and, without a doubt, its impact on human health and the environment are the issues that cause the greatest concern and get the attention of citizens.

In order to respond to this urgent challenge, questions arise regarding the sources responsible for air, water and soil pollution and their impact on both people's health and the environment. Hence, in 2005, the political authority approved the implementation of the Pollutant Release and Transfer Register (PRTR)[1], as a strong environmental management tool and acknowledged the citizens' "right to know" regarding this information, which is declared in Principle 10 of Agenda 21.

As established in the Action Plan for the Implementation of the PRTR, with the modification of Law 19.300 in 2010, the "Administration of the Pollutant Release and Transfer Register" is incorporated as a permanent function of the Ministry of the Environment (article 70, letter p), indicating that its operation will be governed by its regulation, which was passed through Supreme Decree N° 1/2013 of the MMA in May 2013.

PRINCIPLE 10

Environmental issues are best handled with the participation of all concerned citizens at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy, shall be provided.

[1] CONAMA Agreement N° 277/2005: Approves the Creation of the Operational Committee "National PRTR Coordination Group" and the indicated Action Plan.

AGENDA 21

It is a United Nations (UN) agreement to promote sustainable development. It was approved at the United Nations Conference on Environment and Development (UNCED), which met in Rio de Janeiro between June 3 and 14, 1992. This agreement was signed along with the Rio Declaration on Environment and Development and the Statement of Forest Principles. The Agenda is a detailed plan with actions that must be taken globally, nationally and locally by organizations of the United Nations System, governments of its Member States, and by major groups in all areas in which human impacts on the environment occur.

This regulation establishes a new way of gathering information from industrial facilities through a one-stop shop, which is an electronic platform that is accessed by users in a single way, registering their facility, the physical space where it is located, and the pollutant emissions and transfers it generates as a result of its economic activity.

The benefits of this platform, both for industrial facilities and State agencies, are clear, making it easier to provide information on behalf of the regulated industries and improving management coordination and efficiency among public institutions with competence on environmental issues.

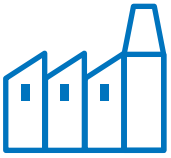
Figure 1. **Benefits of the PRTR in Chile**

MINISTRY OF THE ENVIRONMENT

- Improves efficiency in gathering information and among its users.
- Standardizes nomenclature and codes for chemical substances.
- Enables generating environmental performance indicators.
- Enables complying with international commitments (Agreements and Protocols).
- Makes it easier to prepare environmental reports and contributes to comply with commitments to the OECD.

STATE INSTITUTIONS

- Reduces the maintenance costs of sectoral systems.
- Improves access to quality information by other State Institutions.
- Gathers new key information for State Institutions.
- Contributes to improving surveillance tasks.



INDUSTRY

- Concentrates in a single portal different reporting obligations.
- Enables comparing the environmental behavior of similar industries.
- Centralizes report statement certificates in a single system.
- Encourages industries to reduce emissions and adopt Clean Production Mechanisms.

CIVIL SOCIETY

- Holds information on potential health risks for the population.
- Contributes to informed participation in environmental management.
- Holds information for expert audiences.
- Holds information with educational purposes.

Source: Ministry of the Environment, Chile.

The Chilean PRTR is an environmental management tool that has evolved over time, becoming a key element for the preparation and compliance of the Environmental Public Policies. The impact of the PRTR on the country's environmental management is such that the main public policy tools, such as environmental plans and standards, green taxes to stationary sources, and the Recycling Law, are contained in this platform.

This manual has been prepared with the aim of providing a guide for countries interested in learning about Chile's practical experience in designing and implementing a Pollutant Release and Transfer Register (PRTR). It is expected that this document may contribute guidelines to face the different stages of its adequate preparation.

Department of Environmental Information
Division of Information and Environmental Economics
Ministry of the Environment

02 INTRODUCTION

Chile was late in establishing its environmental institutional framework, in comparison to other countries of the Region. With the return to democracy, Law N°19.300 on the General Environmental Framework was passed and the National Environment Commission (CONAMA by its acronym in Spanish) was created in 1994. This institution was in charge of coordinating environmental management among the different public agencies with competence on environmental matters. During that decade, the preparation of the Decontamination Plan for the Santiago Metropolitan Region was initiated, along with some air emission standards for areas with mining activity. Over the following decade, a series of air and water emission standards was approved, as well as regulations for the adequate treatment of hazardous solid and liquid waste.

As a result, the processes for reporting all this information by those required to comply with them began. The information was sent in different formats and mainly on paper, which made it very difficult to use these data to verify the compliance with the legislation. Because of that, each of the public agencies initiated, with varying degrees of progress, electronic reporting systems, characterizing the reported data according to their needs and imposed obligations.

At the same time, the country began opening its economy by signing a series of free trade agreements, some of which contained cooperation commitments in environmental matters, such as Canada, under which a cooperation agreement on matters of interest to both countries was signed. It was within the framework of citizen participation of this agreement that Canada offered Chile to develop, during 2002, a workshop to present its experience, and that of other countries, regarding pollutant release and transfer registers, from the perspectives of the government, industry, and organized civil society. Our country, therefore, presented the situation in terms of environmental legislation obligations and some alternatives for managing this large amount of information that was being generated for the compliance with air and water quality and emission standards.

In this scenario, through the Chile-Canada Agreement on Environmental Cooperation, Canada offered its cooperation, through the United Nations Institute for Training and Research (UNITAR) as executing agency, initiating the diagnosis to assess the feasibility of developing a PRTR in Chile, which proved that the country was in condition to make progress regarding this challenge. Parallel to this situation, the Free Trade Agreement with the United States of America was signed, which specified in its environmental cooperation framework the development of the PRTR in Chile. Hence, this enabled the instrument to be designed and to prepare a short-, medium- and long-term action plan for its implementation, which was approved by CONAMA's Steering Council.

With this support from the environmental authority, it was possible to begin development of the PRTR, which, between 2005 and 2013, operated as a central node where public agencies with competence on environmental matters sent their databases in order to generate the biannual reports on air and water emissions and the pollutant transfers from hazardous waste and liquid industrial waste to sewerage. At

the same time, CONAMA estimated non-point source emissions generated by transportation.

Although it allowed building trust and coordinating with the different public agencies holding the information, this initial model presented a series of weaknesses in terms of the quality of the data, their completeness and the cohesion between different databases.

As it was established in its action plan, the PRTR was incorporated into Law N°19.300 on the General Environmental Framework in 2010 through article 70 letter p) as a permanent function of the recently created Ministry of the Environment, which replaced CONAMA.

The PRTR One-Stop Shop is defined as a single access and reporting form with the aim of concentrating the information that needs to be reported within a database.

This legal framework allowed the PRTR to become, over time, a strategic tool for the country's environmental management.

A key milestone for strengthening the PRTR was the passing, in 2013, of its regulation (Supreme Decree N.°1/2013 of the MMA), turning it from a central node and the repository of environmental information on pollutant release and transfers, into a tool through which all legal obligations regarding air, water, and soil emissions, municipal waste, hazardous and non-hazardous industrial waste, and pollutant transfers are declared through the PRTR One-Stop Shop, defined as a single access and reporting form with the aim of concentrating the information that needs to be reported within a database that allows for comparisons to be made and facilitates its submission by whomever is required to report.

Since then, the Ministry of the Environment came to have a key role in gathering all the information established in different legislation regarding the PRTR, becoming the State benchmark in these matters.

On the other hand, access to environmental information in itself became a legal and institutional management tool. Said access is provided, among other products, through the preparation of the "State of the Environment Report" (SOE) every four years, and the "Annual State of the Environment Report" (REMA by its acronym in Spanish) each year at the national and regional levels. The Pollutant Release and Transfer Register (PRTR) has become an essential input for developing the indicators presented in both of them.

The PRTR also makes a substantial contribution in terms of indicators for environmental performance evaluations, carried out within the framework of the Organisation for Economic Co-operation and Development (OECD), of which Chile is a member since January 2010. At the same time, it is a valuable input for the questionnaires for the State of the Environment Report that must be submitted to the same organization every two years.

Likewise, in September 2015, at the United Nations Sustainable Development Summit, the countries agreed to adopt the Agenda for Sustainable Development (the 2030 Agenda), which contains 17 goals that will guide the efforts of the countries to achieve a sustainable world by 2030. In this context, Chile has identified at least six sustainable development goals (SDGs) to which the PRTR can provide information for developing indicators to assess the achievement of their targets.

Chile is interested in having its experience in the design and implementation of the Pollutant Release and Transfer Register (PRTR) be a source of inspiration and/or a model for countries committed to developing such a tool, making it possible for them to achieve similar goals, and enabling decision making in matters of environmental public policy to be based on greater and better information, within the context of their national reality.

Stationary emissions from an industrial facility | Ministry of the Environment

Air emissions from an industry in the metal production sector | Ministry of the Environment

03 BRIEF HISTORY OF THE PRTRs

The idea of establishing a Pollutant Release and Transfer Register (PRTR) emerged for the first time in the United States after the tragic accident in Bhopal (India) in 1984. Shortly after, the Congress of the United States of America passed the Emergency Planning and Community Right-to-Know Act (EPCRA) to create the Toxics Release Inventory (TRI), which records pollutant releases into the air, water and soil as well as transfers outside the facility of over 600 chemical substances. This inventory provides unprecedented public information on pollutant emissions. It also created a strong incentive for facilities to take voluntary measures to reduce pollution.

Although a PRTR does not directly regulate releases, it creates pressure on companies to avoid being identified as the main culprits of pollution and it provides incentives for facilities to invest in reducing their emissions.

Public access to information is a core feature of the PRTR and, in fact, it contributes to the prevention and reduction of environmental pollution. Because of that, the 1992 United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro (Brazil) acknowledged the importance of public access to information about environmental pollution, including release inventories, in its Agenda 21. Principle 10 establishes that "each individual shall have appropriate access to information concerning the environment that is held by public authorities," as well as "the opportunity to participate in decision-making processes." To that end, "the States shall facilitate and encourage public awareness and participation by making information widely available."

> The Bhopal Disaster, which took place on December 3, 1984 in the region of Bhopal (India), originated as a result of a leak of methyl isocyanate (MIC) gas in a pesticide plant, of which 51% was the property of the United States Union Carbide Corporation (which later sold part of its assets to Dow Chemical Company), while the remaining 49% was owned by the Government of India.

After the UNCED, the Organisation for Economic Co-operation and Development (OECD) took the first steps to achieve this goal. Thus, in 1993, the Member States of the OECD and the United Nations mandated the Secretary General of the OECD to prepare a guidebook for national governments interested in pollutant release and transfer registers, which was published in 1996. In addition, a working group was created within the OECD to look after the most difficult aspects of creating PRTRs. In accordance to the UNCED recommendation, the OECD undertook this task within the framework of its Inter-Organization Programme for the Sound Management of Chemicals (IOMC).

Following the evolution of PRTRs over the past 30 years, three essential elements can be identified:

A. A structured database

B. A network for exchanging information and publishing data

C. A dissemination mechanism to convert data into information (such as reports on releases) that is publicly available.

PRTRs may include data from point sources (facilities), as well as from non-point or diffuse sources, such as agricultural and waste burns, transportation, and other human activities.

The PRTR is a tool to support informed decision making by companies, government agencies, non-governmental organizations and the general public, by generating publicly available information regarding industrial management of toxic chemical substances and the main pollutants.

The PRTR is not a static inventory. It is a dynamic system that provides annual data directly recorded by the facilities to the national authority (in most countries, the environmental authority).

What is a Pollutant Release and Transfer Register?

Following the explanation of how PRTRs emerged, these are defined as a catalogue or database that contains information regarding the nature and amount of releases and transfers of chemical substances and pollutants that are potentially harmful for human and environmental health, produced in a specific place and period. The information on releases contained in the PRTR includes air, water and soil, as well as pollutant transfers, according to the scope established by each country. Nevertheless, PRTRs generally establish the final disposal and other off-site waste elimination or treatment methods as pollutant transfers.

Pollutant Release and Transfer Registers are tools with great potential for controlling and reducing pollution and for overall environmental management. If they are well conceived and implemented, they can be highly beneficial for the government, businesses and citizens.

PRTRs include the following benefits:

Table 1. **Benefits of a PRTR**

GOVERNMENT

Identifying problem areas and establishing priorities in environmental matters.

Making decisions in terms of environmental and health policies, based on reliable and up-to-date information.

Monitoring environmental targets.

Modernizing environmental regulation and the ecological organization of the territory.

Simplifying and reducing information gathering and procedures.

Complying with international commitments on environmental information.

Promoting education and citizen engagement.

Strengthening the National Environmental Information System.

INDUSTRY

Implementing environmental management systems and their certification (ISO 14000, OSHA, etc.).

Improving pollutant prevention, reduction and control processes.

Identifying deficient processes.

Improving industrial self-regulation.

Using cleaner production technology.

Using inputs more efficiently and improving waste management.

Greater competitiveness.

CITIZENS

Having information on types of pollutants, chemical substances and processes to which the population is exposed in different regions of the country or in specific communities.

Providing information to address potential solutions to environmental problems of the affected communities.

Promoting and organizing activities to prevent pollution and manage plans to avoid accidents or environmental risks.

Improving the response in the face of emergency situations.

Improving occupational health conditions.

Participating in the preparation and evaluation of the effectiveness of environmental policies.

Proposing and participating, in an informed manner, in the preparation of laws and standards that protect the environment and human health.

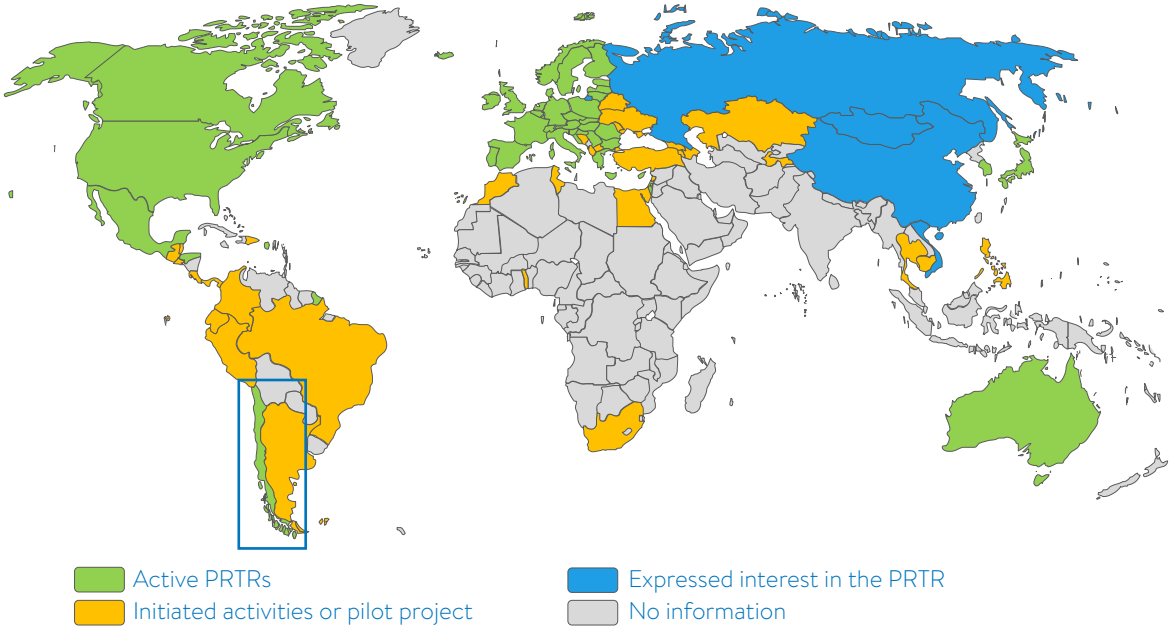
Making the access to key information on the greatest sources of pollution more democratic.

Source: UNITAR, 1997 modified by the Ministry of the Environment, Chile.

Boiler chimney in an industrial facility | Ministry of the Environment

04 PRTRs AT THE GLOBAL LEVEL

Map 1 **Global Map of the State of PRTRs in the World**



Source: https://prtr.unece.org/prtr-global-map

At present, there is broad international experience regarding PRTRs, with programs implemented in most of the member countries of the Organisation for Economic Co-operation and Development (OECD), such as: The Toxic Release Inventory (TRI)[2] in the United States; the National Pollutant Release Inventory (NPRI)[3] in Canada; the National Pollutant Inventory (NPI)[4] in Australia; and the PRTR in Japan[5], among others.

PRTRs have been established throughout the world to identify and follow up on releases and treated waste of chemical products (i.e. amounts recycled, used for energy recovery or disposed of in safe locations) and pollutants that are potentially harmful for human health and the environment. Many countries have created their own PRTRs[6] or have initiated a pilot PRTR, while other countries have plans to implement them in the near future[7].

During the 1990s, the OECD supported the design and implementation of PRTRs through the development of documents and guideline manuals. Nevertheless, there is no one single PRTR and each country develops it in accordance to its national reality and the goals it establishes.

A comparison of the Chile PRTR with the rest of the countries can be seen in Table 2:

[2] https://www.epa.gov/toxics-release-inventory-tri-program

[3] https://www.canada.ca/en/services/environment/pollution-waste-management/national-pollutant-release-inventory.html

[4] http://www.npi.gov.au/

[5] https://www.env.go.jp/en/chemi/prtr/prtr.html

[6] See Annex 3

[7] Belarus, Cambodia, Colombia, Costa Rica, Ecuador, Kazakhstan, Moldova, Peru, and Vietnam.

Table 2. **Comparison of PRTRs at the Global Level and the PRTR in Chile**

Features	Kiev Protocol (+)	Australia NPI	Canada (NPRI) (++++)	UE E- PRTR (++)
Name of the Registry		National Pollutant Inventory (NPI)	National Pollutant Release Inventory (NPRI)	European Pollutant Release and Transfer Register (E-PRTR)
Specific Legislation	Yes	Yes	Yes	Yes
Information Unit	Facility	Facility	Facility	Facility
Productive Activities	List of industrial activities	ISIC	Canadian System	List of industrial activities
Types of Sources	Point and non-point sources	Point and non-point sources	Point and non-point sources	Point and non-point sources
N° of Pollutants	86	93	346	91
Other Physical, Chemical and Biological Parameters				
Waste Transfers Outside the Facility	Transfers of hazardous and non-hazardous waste	Transfers of polluting substances within waste	Transfers of polluting substances within waste	Transfers of hazardous and non-hazardous waste
Reporting Thresholds	For activity categories, pollutant releases and transfers	For activity categories, pollutant releases and transfers	For activity categories, pollutant releases and transfers	For activity categories, pollutant releases and transfers
Calculation Methods	Measurement, calculation, estimate	Mass balance, engineering calculations, emission factors	Mass balance, engineering calculations, emission factors	Measurement, calculation, estimate
Receptor Media	Yes	Yes	Yes	Yes
Period	Annual	Annual	Annual	Annual

PRTR-España (+++)	Japan	US TRI (++++)	PRTR Mexico (++++)	PRTR Chile
Spanish Register of Emissions and Pollutant Sources (PRTR-España)	Japanese Pollutant Release and Transfer Register (PRTR-Japan)	Toxic Release Inventory (TRI)	Pollutant Release and Transfer Register (PRTR)	Pollutant Release and Transfer Register (PRTR)
Yes	Yes	Yes	Yes	Yes
Facility	Business facility	Facility	Facility	Facility
List of industrial activities	List of industrial activities	ISIC	ISIC	List of industrial activities
Point and non-point sources	Point and non-point sources	Point and non-point sources	Point and non-point sources	Point and non-point sources
115	462	682 (i)	104	130
Yes			Yes	Yes
Transfers of any type of waste according to the European List of Waste (ELW)	Transfers of polluting substances within waste	Transfers of polluting substances within waste	Transfers of polluting substances within waste	Transfers of hazardous and liquid industrial waste
Only for activity categories.	For activity categories, pollutant releases and transfers.	For activity categories, pollutant releases and transfers.	For activity categories, pollutant releases and transfers.	For activity categories, pollutant releases and transfers.
Measurement, calculation, estimate	Mass balance, engineering calculations, emission factors	Mass balance, engineering calculations, emission factors	Mass balance, engineering calculations, emission factors	Measurement, calculation, emission factors
Yes	Yes	Yes	Yes	Yes
Annual	Annual	Annual	Annual	Annual

> continues

Features	Kiev Protocol (+)	Australia NPI	Canada (NPRI) (++++)	UE E- PRTR (++)
Nature	Mandatory	Mandatory	Mandatory	Mandatory
Online Electronic Reporting Format	Yes	Yes	Yes	Yes
Public Information	Yes	Yes	Yes	Yes
Confidentiality	Yes	Yes	Yes	Yes
Website	http://www.prtr-es.es/Data/images//Guía-de-implantación-del-Protocolo-PRTR-en-inglés.pdf	www.npi.gov.au	https://www.canada.ca/en/services/environment/pollution-waste-management/national-pollutant-release-inventory.html	http://prtr.ec.europa.eu/#/home

Source: Iñigo de Vicente (PRTR – España), modified by Marcos Serrano (Ministry of the Environment - Chile).

PRTR-España (+++)	Japan	US TRI (++++)	PRTR Mexico (++++)	PRTR Chile
Mandatory	Mandatory	Mandatory	Mandatory	Mandatory
Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes
http://www.prtr-es.es	www.env.go.jp	www.epa.gov/tri	http://apps1.semarnat.gob.mx/retc/index.html	www.retc.cl

Industrial chimney in a copper foundry | Ministry of the Environment

05 DESIGNING THE PRTR IN CHILE

Taking into account the recommendations established in the 1992 United Nations Conference on Environment and Development (UNCED) and the environmental cooperation agreements established in the Free Trade Agreements (FTAs) with Canada (1997)[8] and the United States (2004)[9], the idea of creating in Chile a public inventory of pollutant emissions and transfers that may pose a danger for human health and the quality of the environment arose and gained strength.

Thus, within the framework of the Chile-Canada Commission for Environmental Commission, the process of designing the PRTR for environment in Chile began in 2002 and continued until 2005, when the Council of Ministries of CONAMA (the predecessor of the Ministry of the Environment) approved the "National Proposal and Action Plan for the Implementation of a National Pollutant Release and Transfer Register (PRTR) in Chile" [10].

As a first step, in 2002 a workshop was held with the participation of international experts. This event allowed learning about the experiences of Canada, Mexico and other PRTR programs throughout the world. As a result, the possibility of developing the PRTR in Chile was explored, with the support of UNITAR and following the guidelines defined in its Guidance Document: Implementing a National PRTR Design Project[11] (1997), which suggests following a series of six stages for its definition, as presented below.

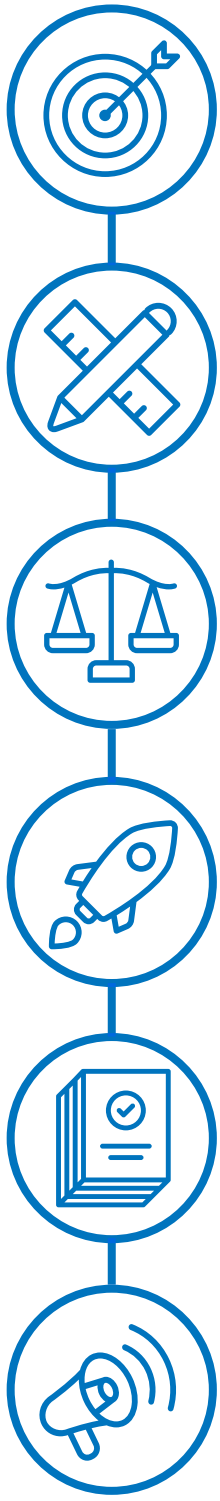
[8] Signed in Santiago, Chile, on December 5, 1996, it was passed through Supreme Decree Number 1.020 of the Ministry of Foreign Affairs on July 3, 1997, published in the Official Gazette on July 5, 1997, and entered into force on July 5, 1997.

[9] Signed in Miami, United States, on June 6, 2003, it was passed through Supreme Decree Number 312 of the Ministry of Foreign Affairs on December 1, 2003, published in the Official Gazette on December 30, 2003, and entered into force on January 1, 2004. Chapter 19 concerning the Environment in Annex 19.3 on Environmental Cooperation, "Development of a Pollutant Release and Transfer Register (PRTR) in Chile".

[10] http://catalogador.mma.gob.cl:8080/geonetwork/srv/spa/resources.get?uuid=12c-3db83-ba06-493e-8b70-eac0835f1640&fname=Chile_national_prtr_proposal.pdf&access=public

[11] http://cwm.unitar.org/national-profiles/publications/cw/prtr/prtr_en/prtrgd_nov2003.pdf

Table 3. **Stages for the Design and Implementation of the PRTR Followed by Chile**



STAGE I

Identifying the objectives and uses of the National PRTR System

Identifying and agreeing on the national objectives for the PRTR system, holding consultations with all stakeholders.

STAGE II

Assessing the Existing Infrastructure Relevant to the National PRTR

Conducting a comprehensive assessment of the existing legal, regulatory, institutional, administrative and technical infrastructure and available national expertise relevant for designing and implementing a national PRTR system.

STAGE III

Designing the Key Features of the National PRTR System

Making decisions on key features and characteristics of the national PRTR system in line with the established PRTR objectives.

STAGE IV

Conducting a PRTR Pilot Reporting Trial

Testing the Registry system on a limited scale to gather practical insights into operational challenges and as an input towards finalizing the national PRTR proposal.

STAGE V

Finalizing the National PRTR Proposal

Preparing a final document which outlines the complete specifications of the national PRTR system to be submitted for approval by national authorities.

STAGE VI

Dissemination of the implementation of the National PRTR

Holding a national workshop to secure policy commitment and launch an action plan for implementation of the national PRTR system.

Source: http://cwm.unitar.org/national-profiles/publications/cw/prtr/prtr_en/prtrgd_nov2003.pdf

Storage yard for raw materials for the paper and pulp industry | Ministry of the Environment

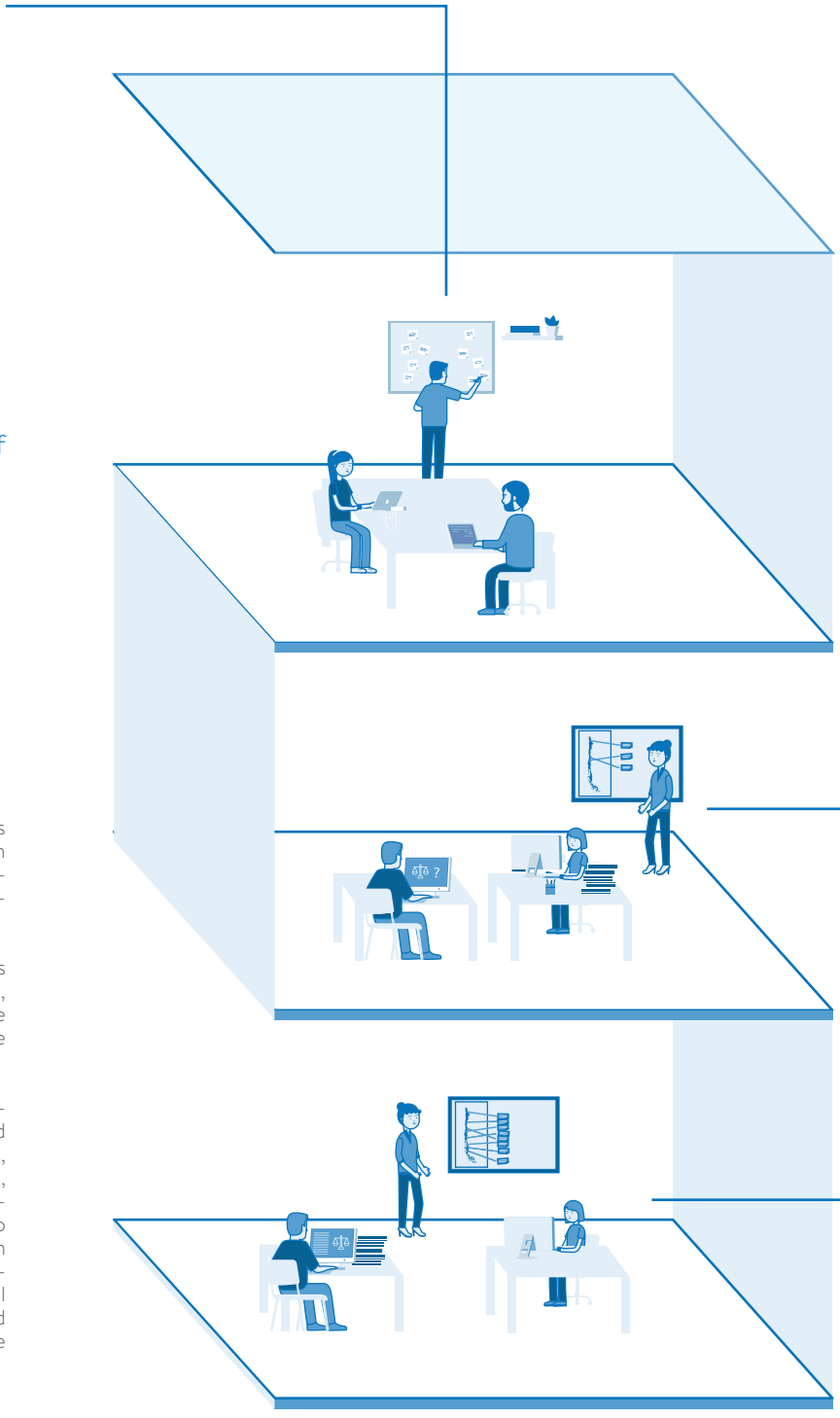
The following illustration provides an example of how these six stages were developed in the case of Chile:

Figure 2. **Stages in the Development of the PRTR in Chile**

1. STAGE

Identification of Objectives and Uses[12]

- Supporting Environmental Diagnosis Processes.
- Supporting Environmental Surveillance Processes.
- Supporting the Environmental Impact Assessment System (SEIA by its acronym in Spanish).
- Supporting the Implementation of Environmental Management Tools.
- Establishing a homogenous information base.
- Supporting the Implementation of International Agreements.



[12] The National Coordination Group (GNC by its acronym in Spanish) was created at this stage, in December 2002, with the participation of the government, industry, non-governmental organizations, and academic sectors.

[13] In order to develop this stage, commissions were created during 2003 to work on legal, technical, and computing matters, evaluating the requirements of such a registry and preparing the first proposals in these areas.

[14] Considering that the PRTR deals with the registry of releases and transfers of waste generated as externalities from diverse economic activities, which affect the national environmental heritage, whose ownership and protection is the responsibility of the State, the latter has the authority to establish the necessary control and information mechanisms to effectively protect the environment and to develop the pertinent environmental management tools and policies, which, reflected in adequate legal provisions, force their compliance by the economic activities that generate them.

2. STAGE

Assessment of Existing Infrastructure

During this stage, it was determined that, in terms of legal infrastructure, a series of regulations was being prepared regarding water emissions and hazardous waste, but there was a regulation deficit regarding air emissions. It was also determined that there was no regulation regarding hazardous waste.

In terms of infrastructure, regarding the collection of data on pollutant releases and transfers, a series of computer systems were being developed to collect information on air emissions and hazardous waste. As for air emissions, information on them was only available for specific economic activities, in certain geographical areas, as was reported on paper.

Regarding trained human resources, the country had the decentralized capacity to manage its sectoral legislation. The same was true for its computer and surveillance systems. Nevertheless, there was a lack of experience and capacity in the country regarding PRTRs.

3. STAGE

Design of Key Features [13]

Legal:

A legal study was conducted to analyze the feasibility of the PRTR. This consisted of a constitutional analysis[14], how to incorporate it into Law 19.300 of the Environment, since, according to Chilean legislation, it is not possible to create a register without a law that supports it. In addition, an outline was prepared for the regulation with the key elements it had to include. Regarding the implementation of a pollutant releases and transfers report, based on the data reported by industry sectors to other public agencies, it was decided that it could be supported by an agreement of the Council of Ministers of CONAMA, in order to have public agencies comply with this obligation, and that the transfer of the databases would be done through collaboration agreements.

Technical:

Because of the decentralization of environmental legal obligations, as well as their surveillance, and the computer systems that were being developed, it was decided that the key element for collecting data on pollutant releases and transfers, respecting the organization of the State, would be the development of a one-stop shop as the medium through which the industrial sector would comply with all sectoral obligations imposed by the State on these matters.

Computer:

As a result of the dispersion of sectoral computer systems, and since Chile is a decentralized State in terms of environmental legal authority, it was not possible to centralize computer systems. Hence, it was decided to develop a central node as a repository of the information collected by each sectoral system, while there was no PRTR supported by the law of the environment. The features of the central node developed were based on the definition/conception of the Chilean PRTR, that is, on the convergence of a large amount of environmental reports. From that perspective, it was important to know what information it would include, how it would work, and how the data would be transferred from the sectoral systems.

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The main challenge of any country that decides to develop a PRTR is to have clarity from the start of the uses and scope of this powerful tool.

In the case of our country, the defined uses and their scope have been broadly exceeded and it has become a strategic tool for the registry, administration, systematization, preparation, and publication of environmental information that is key for the environmental public policy.

4. STAGE

Execution of a Pilot Test

Facilities grouped in the Chemical Industry Trade Association of Chile (ASIQUIM by its acronym in Spanish) collaborated with the pilot test. These facilities submitted reports through the information systems that were being created, for each separate sectoral system.

5. STAGE

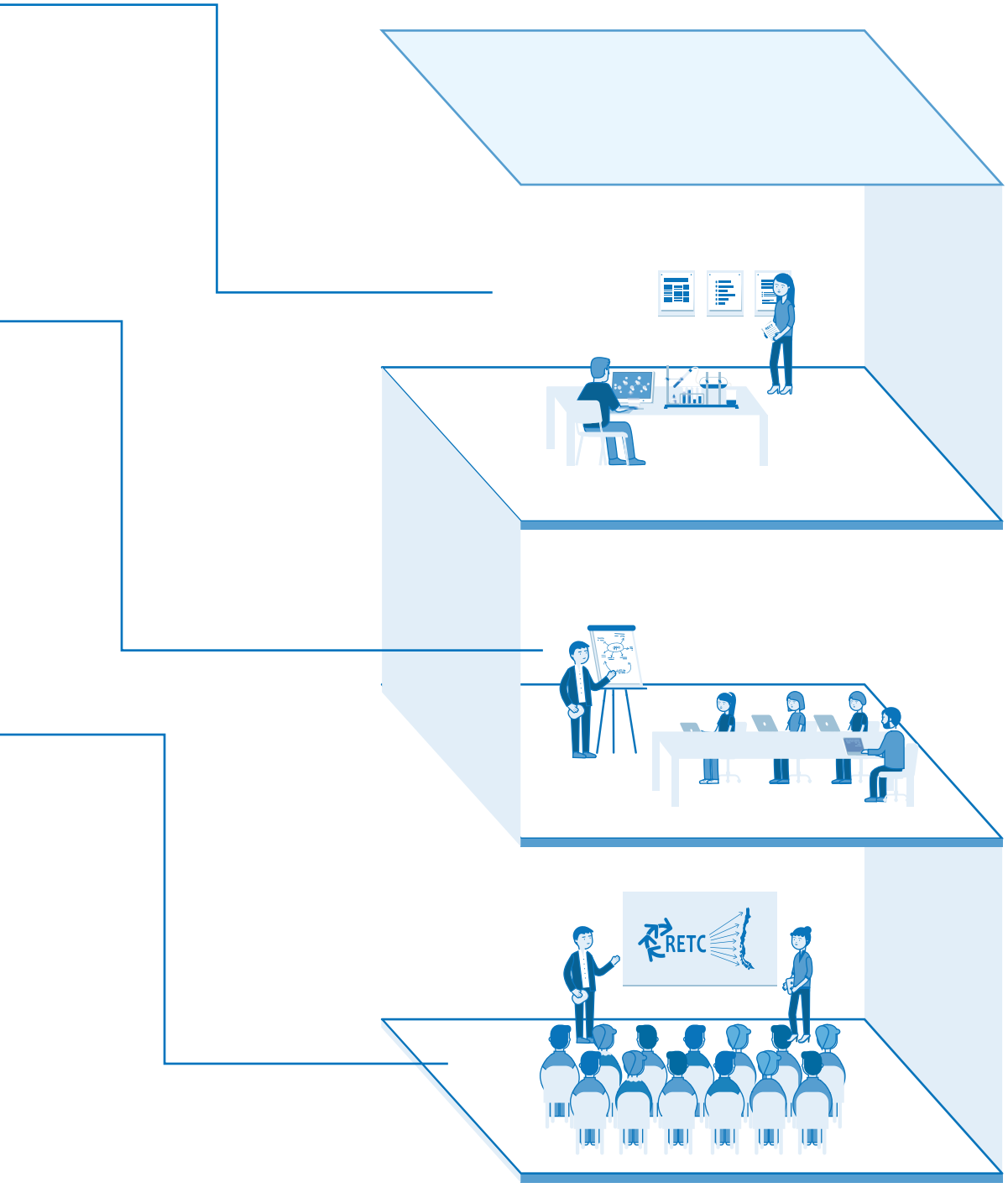
National Proposal

In the national proposal, an effort was made to present each of the decisions made by the National Coordination Group in each of the previous stages. In addition, a short- medium- and long-term action plan was prepared with its corresponding budget. It was presented to the Council of Ministers of CONAMA for its approval.

6. STAGE

Dissemination of the National Proposal and Political Commitment for its Implementation

The National Proposal for the Pollutant Release and Transfer Register and the Action Plan for its implementation were approved by the Council of Ministers of CONAMA through Agreement N°277, signed on June 23, 2005. That same year, CONAMA organized a workshop to present the National Proposal and the Action Plan for its implementation, with the participation of the National Coordination Group, representatives of the United States Environmental Protection Agency (USEPA), the Canadian Ministry of Environment and Climate Change (EC), Mexico's Secretariat of Environment and Natural Resources (SEMARNAT), and the United Nations Institute for Training and Research (UNITAR). This plan was also disseminated through the press.



Source: Ministry of the Environment, Chile

Industrial activity of the metal production sector | Ministry of the Environment

06 DEVELOPMENT OF THE PRTR: THE CHILEAN EXPERIENCE

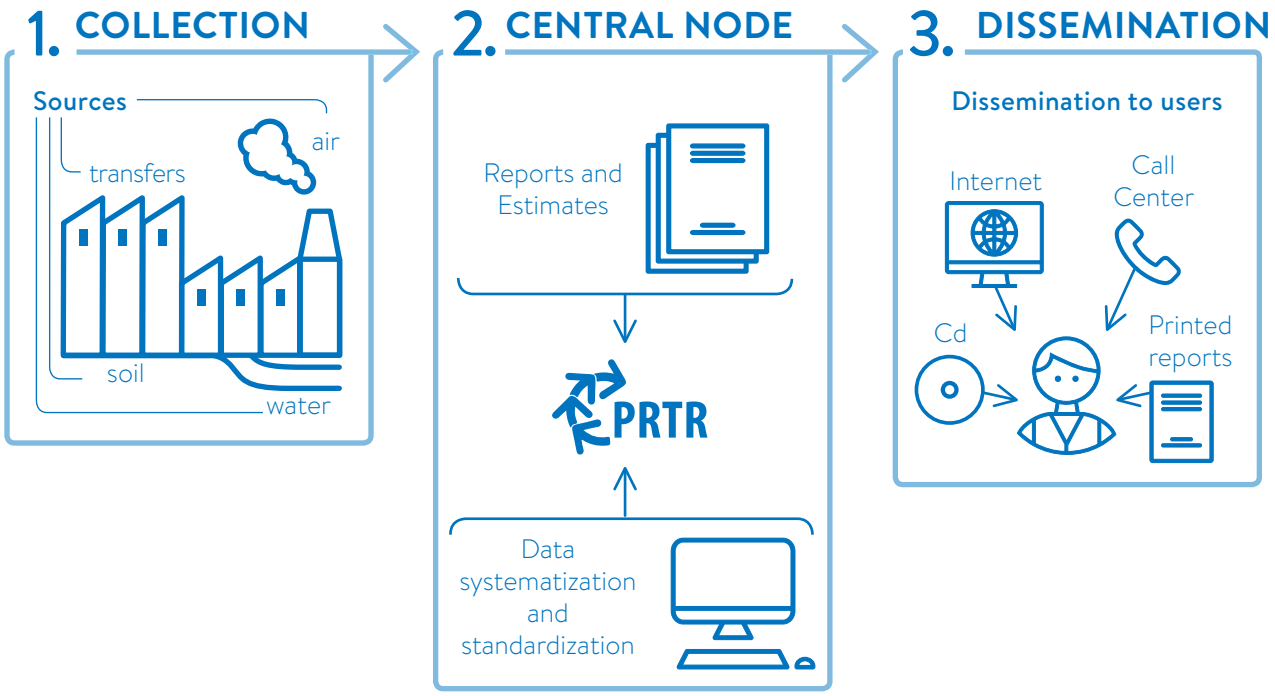
Once the PRTR design and implementation stages followed by Chile had concluded, based on the Guidance Document: Implementing a National PRTR Design Project (UNITAR, 1997)[15], and its national proposal and action plan were approved, in 2005 CONAMA began the preparation of the cooperation agreements[16] to guarantee the transfer of information.

As a result, the initial efforts focused on establishing a model made up of three stages. The first of them is the collection of information, in which the industry reported to the different sectoral agencies with competence on environmental matters, as it had been doing so far. The second stage, managed by CONAMA, was the Central Node, where sectoral agencies transferred their databases to CONAMA in order for it to prepare the PRTR Report, along with its estimates for non-point or diffuse sources. Finally, the third stage was dissemination. Different mechanisms were defined to disseminate this information (www.retc.cl website, PRTR reports, press, and printed materials, among others). This model is presented in the following figure.

[15] http://cwm.unitar.org/national-profiles/publications/cw/prtr/prtr_en/prtrgd_nov2003.pdf

[16] Cooperation agreements were signed with the following: Ministry of Health (transfer of data on air emissions and hazardous waste); Superintendency of Sanitation Services (transfer of data on emissions to surface water and groundwater); General Directorate of Maritime Territory and the Merchant Marine (transfer of data on emissions to ocean water); Ministry of Transportations and Telecommunications (Transportation Models to estimate air emissions generated by road transportation); Internal Revenue Service (directory of tax payers and their addresses); and Correos de Chile, the public enterprise in charge of the mail (to assign a postal code to facilities).

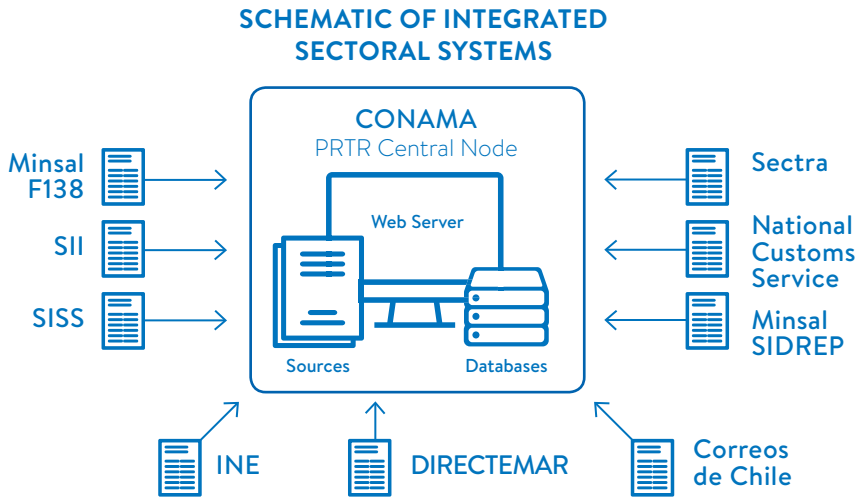
Figure 3. **PRTR Operation Model (2007-2013)**



Source: Ministry of the Environment, Chile.

One of the main efforts made by CONAMA during this stage consisted of developing the PRTR's central node, a date repository where the public agencies with which cooperation agreements were signed transferred their sectoral databases to prepare the annual PRTR reports.

Figure 4. **PRTR Central Node**



Source: Ministry of the Environment, Chile.

As the number of facilities that submitted their mandatory reports increased and the sectoral information systems were consolidated, the semi-automatic merging of the databases that fed the PRTR central node became more complex. The main problems were: The use of different classifications of industrial activities or different versions of them; the same facilities were assigned to different communes; out of date Unique Taxpayer Reference (UTR); measure units that could not be compared; and duplicated facilities, among others.

Despite the fact that CONAMA sent the merged and corrected databases to the public agencies each year, they were not updated for different reasons, the main one being that they were not legally required to do so. Therefore, the following year they once again sent the databases with the same problems.

Despite these obstacles, CONAMA published the First PRTR Report in 2007, with data on air and water emissions from point sources and air emissions from non-point sources generated by road transportation. This was the model used to prepare the PRTR report between 2005 and 2013.

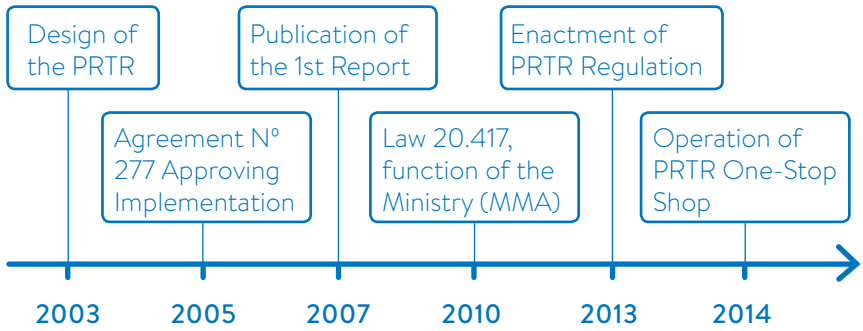
Water storage tank for industrial use | Ministry of the Environment

07 INSTITUTIONAL FRAMEWORK OF THE PRTR

In 2010, Chile took a key step in environmental matters by modifying its institutional framework and creating the Ministry of the Environment, the Environmental Assessment Service and the Superintendency of the Environment, establishing new authorities and obligations for each of the institutions.

With the creation of the Ministry of the Environment[17] (MMA), it was established that one of its functions would be to "Manage the Pollutant Release and Transfer Register" (article 70, letter p)[18]. Its features were defined through a regulation, as established by the Law. Thus, in May 2013, in coordination with the other public services with competence on environmental matters[19], Supreme Decree N°1 was enacted, containing the "Regulation of the PRTR" 20, which establishes the objectives, main definitions, structure, administration, obligations of State agencies, information contained, and obligations of owners of industrial activities that are required to report.

Figure 5. **Institutional Evolution of the PRTR**



Source: Ministry of the Environment, Chile.

[17] Law N°19.300 on the General Environmental Framework, modified by Law 20.417.

[18] Managing a Pollutant Release and Transfer Register, which will record and systematize, by source or group of sources of a same facility, the nature, flow, and concentration of polluting emissions that are the object of an emissions standard, and the nature, volume, and destination of generated solid waste indicated by the Regulation.

Likewise, in the cases and manner established by the Regulation, the register will systematize and estimate the type, flow and concentration, total and by type of source, of the emissions that are not the object of a current emissions standard. To that end, the Ministry will request from the corresponding State agencies general information on productive activities, commodities, productive processes, technology, production volumes and any other information that is available and useful to provide estimates. Estimated emissions referred to in this clause will be innominate and will indicate the modeling methodology used.

[19] Ministry of Public Works, Ministry of Health, Ministry of Mining, and Ministry General Secretariat of the Presidency.

[20] http://bcn.cl/1uw6j

According to the Regulation, the Pollutant Release and Transfer Register (PRTR) is a database accessible to the public, aimed at collecting, compiling, systematizing, conserving, analyzing, and disseminating information on emissions, waste, and transfer of pollutants that are potentially harmful for human health and the environment and that are emitted to the surroundings, generated in industrial or non-industrial activities, or transferred for their valuation of disposal.

To that end, the regulation established the following objectives:

A. Facilitating access to information on emissions, waste, and pollutant transfers;

B. Promoting knowledge of this information among citizens;

C. Serving as a support tool for adopting public policies and regulations;

D. Serving as a tool that contributes to decision making in the design of the environmental management policy aimed at reducing pollution and advancing towards sustainable development;

E. Facilitating the provision of information on emissions, waste, and pollutant transfers to regulated facilities;

F. Promoting the generation of a more adequate environmental management of emissions, waste, and pollutant transfers by industries and municipalities;

G. Generating the One-Stop Shop System as a single access and reporting form with the aim of concentrating the information to be reported in a database that allows it to be merged and facilitates its submission by data reporters.

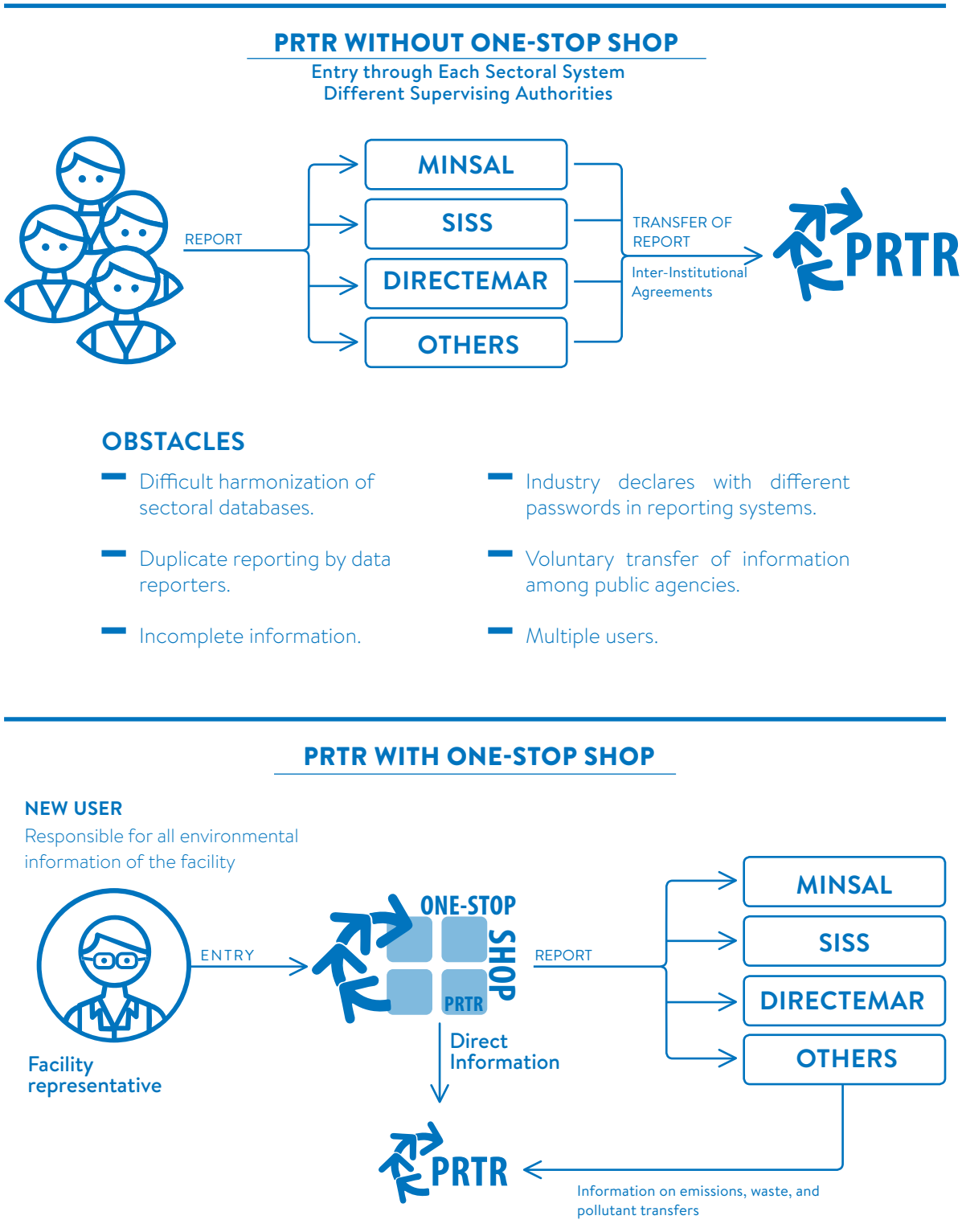
In the case of Chile, its international commitments were a key boost for the creation of the PRTR. Both the international free trade agreements signed by the country, as well as its admittance into the OECD, enabled incorporating it as a permanent function of the recently created Ministry of the Environment.

But that is not enough. For emerging countries that require creating tools that can be a contribution to environmental public policy, it is necessary to incorporate other advantages to the PRTR, which, due to the nature of the tool, can be included in it.

One of the key elements established in the PRTR Regulation, and which makes it unique, is the One-Stop Shop[21], an electronic platform (website) with a single access through which users may register their facilities, its physical location, and the emissions, waste, and pollutant transfers it generates as a result of its economic activity. This new way of collecting information provided several benefits to both industrial facilities and State agencies, making it simpler for regulated facilities to submit information and enhancing the coordination and efficiency in the management conducted by public agencies with competence on environmental matters.

[21] Acting on the OECD recommendation regarding the reduction of duplicate reporting in the implementation of the PRTR. 20 February 196 - C(96)41/Final as amended on 28 May 2003 - C(2003)87.

Figure 6. **PRTR One-Stop Shop**



Source: Ministry of the Environment, Chile.

Another key element established in the PRTR Regulation was the appointment of a Facility Representative, who must be the employee with the highest rank within a facility and will be responsible for reporting the information of the facility to the PRTR, being the only representative recognized by the Ministry of the Environment.

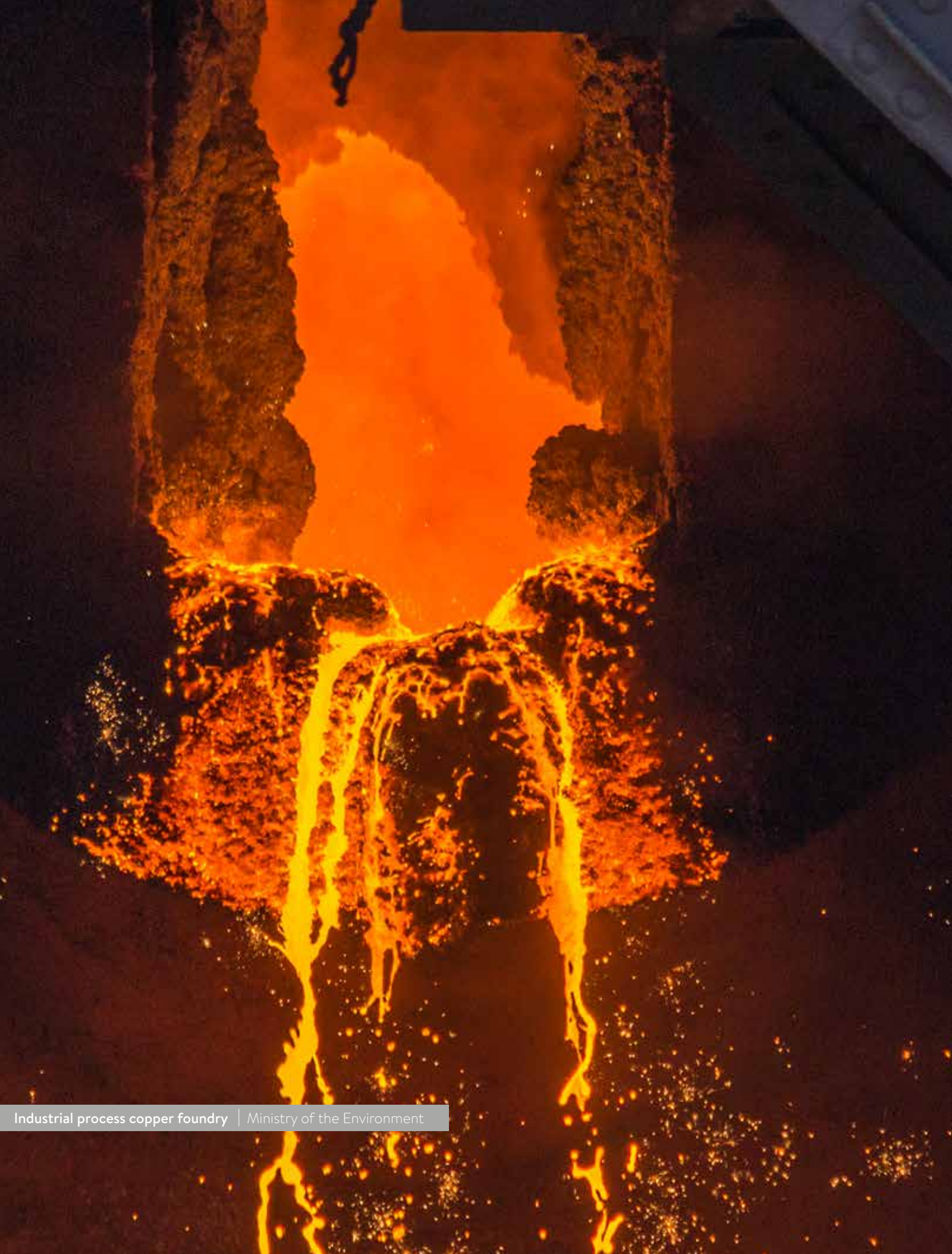
Responsibilities of the Facility Representative

- ✓ Requesting access to the PRTR One-Stop Shop (VU by its acronym in Spanish).
- ✓ Requesting access to the sectoral systems included in the PRTR One-Stop Shop.
- ✓ Assigning the Environmental Qualification Resolutions (RCA by their acronym in Spanish) of the Facility.
- ✓ Creating the industrial users of the facility that may report through the sectoral systems.
- ✓ Submitting the facility's Production Form.
- ✓ Reporting the facility's Environmental Protection Expenditure (GPA by its acronym in Spanish).
- ✓ Submitting the Annual Affidavit.

Finally, regarding the sanctions for not complying with the obligations set forth in the PRTR Regulation, they fall under the authority of the Superintendency of the Environment, as established in its Organic Law 20.417, of 2010, Article 35, letter m): "The noncompliance with the obligation of reporting by the representatives of emission sources for the preparation of the register referred to in letter p) of article 70 of Law 19.300."

In addition, if false information is provided in the Annual Affidavit, the representative risks criminal sanctions[22].

[22] Sanction: "Whomever commits perjury or provides false testimony to the authority or its agents in non-contentious matters will suffer minor prison sentences in their minimum to medium degrees and a fine between six and ten monthly tax units." Article N°210, Criminal Code.



Industrial process copper foundry | Ministry of the Environment

08 KEY FEATURES OF THE PRTR IN CHILE

The key features of the PRTR are based on the convergence of countless environmental reports made by regulated institutions through the one-stop shop, as described above. From that perspective, it is important to know what information is included, how it operates and who should declare what.

8.1 Information included in the PRTR in Chile

The information included in the PRTR in Chile was defined by the National Coordination Group (GNC by its acronym in Spanish)[23], and was established in its regulation:

A. Information from emission, waste, and pollutant transfers reports, in compliance with the provisions of emission standards, prevention and/or decontamination plans, environmental qualification resolutions or any other standard or regulation that establishes the obligation of reporting emissions, waste and/or pollutant transfers, provided by the State Administration agencies with competency for their supervision, as well as information of the same nature obtained from control or surveillance efforts by the above-mentioned institutions, which will need to be submitted to the PRTR by them.

B. Information provided by the State Administration agencies to obtain estimates from diffuse sources and unregulated point sources of emissions.

C. In addition, it will contain information on emissions, waste, and/or pollutant transfers for which our country has accepted the obligation of measuring, quantifying or estimating them, in line with the provisions of international agreements ratified by Chile that are currently in force.

It was also defined that the incorporation of new pollutants will be subject to the entry into force of new environmental legislation and international agreements signed and ratified by the country.

Based on this information, a list of pollutants has been generated. These are gradually incorporated as new PRTR legislation is added or new international environmental agreements are ratified. To date, there are 121 pollutants and nine physical and biological parameters (see Annex 1).

Table 4. **Summary of the Composition of the List of Substances**

Pollutants	121
Physical and Biological Parameters	9
TOTAL	**130**

Source: Ministry of the Environment, Chile.

[23] Operational committee in charge of the coordination, analysis, and management of PRTR operations, made up of representatives of the different public agencies or institutions. This committee may also invite civil society representatives to participate in the sessions, for consulting purposes. The GNC representatives are detailed in Annex 2.

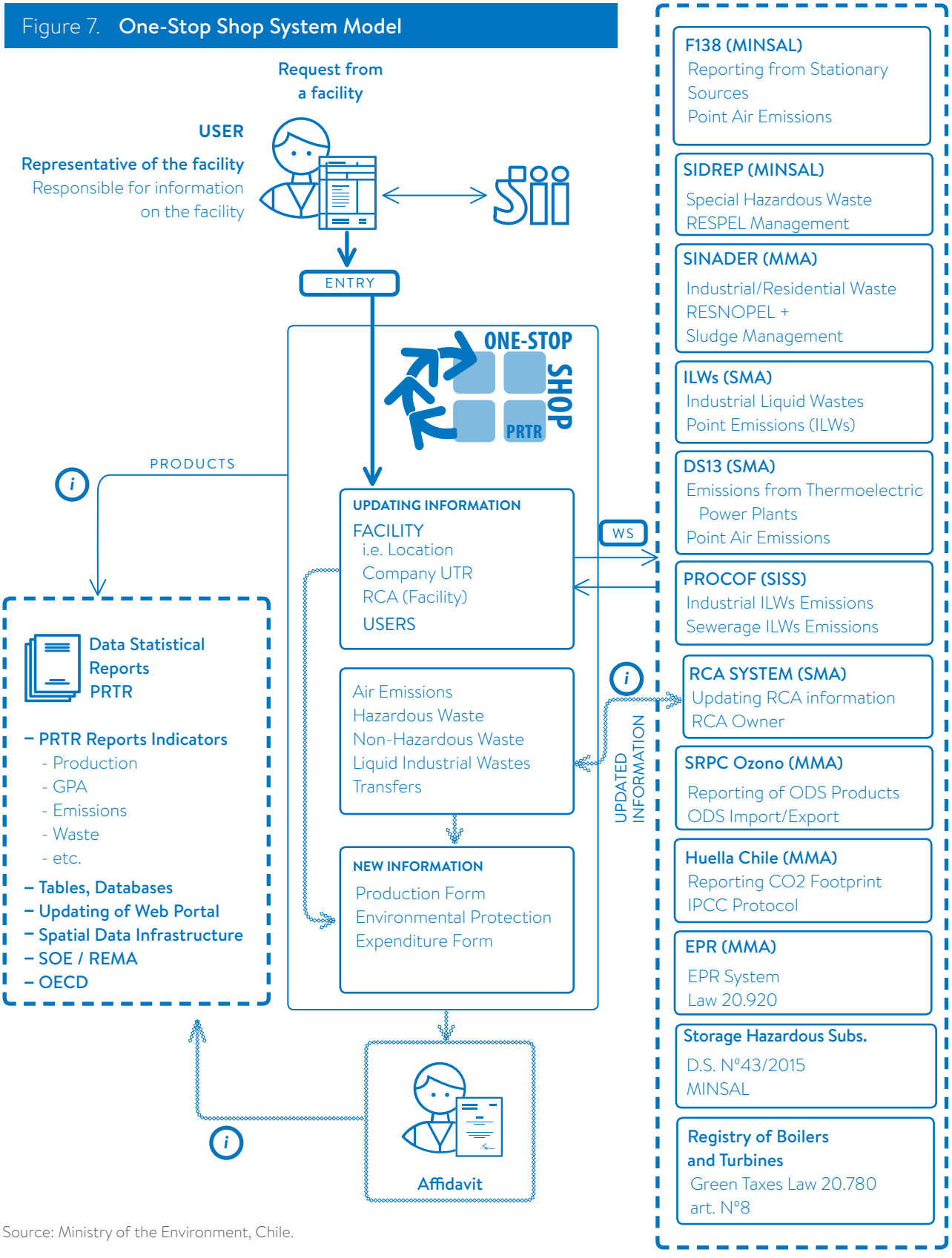
8.2 How is information obtained?

The information available in the PRTR is obtained from the different sectoral systems associated with the reporting of point sources, in addition to the estimate of air emissions from non-point sources (on road transportation, agricultural burns, forest fires, urban fires and residential firewood combustion). As mentioned above, the environmental information related to each topic is compiled by different public sectoral agencies with competence on environmental matters, which must send to the PRTR in May each year all processed information regarding emissions, waste, and/or pollutant transfers that is relevant to prepare the previous year's report, as established in letter c) of article 13 of Supreme Decree N°1/2013 MMA[24].

The information flow related to point sources is presented below, identifying the report that must be submitted by the user, the different sectoral systems and the transfer of data regarding emissions, waste, and pollutant transfers contained in the PRTR.

[24] As evidenced, the transfer of information to the central node of the PRTR by public agencies with competence on environmental matters no longer depends on a collaboration agreement, since with the regulation it becomes an obligation.

Figure 7. **One-Stop Shop System Model**



Source: Ministry of the Environment, Chile.

Based on the agreements of the National Coordination Group (GNC), each sectoral institution, within the framework of the authority of its competence, has had the task of determining the validity[25] of the information transferred to the PRTR.

The table below presents the origin of the information contained in the PRTR in relation to point sources.

Table 5. **Information Contained in the PRTR in Relation to Point Sources**

Information Contained in the PRTR	Related Legislation	Origin of the Information
Air Emissions from Stationary Sources (F-138, Thermoelectric Power Plants and Foundries System)	Supreme Decree N° 138/2005 MINSAL. Supreme Decree N° 13/2011 MMA. Supreme Decree N° 28/2013 MMA.	Ministry of Health Superintendency of the Environment
Generation of Hazardous Wastes Reported through the SIDREP	Supreme Decree N° 148/2003 MINSAL	Ministry of Health
Generation of Non-Hazardous Wastes Reported through the SINADER	Supreme Decree N° 1/2013 MMA.	Ministry of the Environment
Pollutant Release into Marine and Surface Continental Waters (ILWs Supervision)	Supreme Decree N° 90/2000 MINSEGPRES. Supreme Decree N° 80/2006 MINSEGPRES.	Superintendency of the Environment and Superintendency of Sanitation Services
Pollutant Release into Groundwater Bodies (ILWs Supervision and SACEI)	Supreme Decree N° 46/2002 MINSEGPRES.	Superintendency of the Environment
Pollutant Transfer into the Sewerage System (PROCOF).	Supreme Decree N° 609/1998 MOP.	Superintendency of Sanitation Services

Source: Ministry of the Environment, Chile.

Likewise, the table below presents the information contained in the PRTR in relation to non-point or diffuse sources and the different institutions that provide baseline information for estimating emissions.

[25] The issue of validity was thoroughly discussed during the preparation of the regulation and had to be removed, since the services indicated that it could not be committed. The first step of validation model is the work conducted in the sectoral systems by each public agency with competence on environmental matters. This is then sent to the MMA to be analyzed by the Data Mining area. In the following stage, the facility representatives and public agencies work together. In order to guarantee the traceability of the correction of wrong data, this is done in the system that collects these data in their origin. After all of these processes, the data are published.

Table 6. **Information Contained in the PRTR in Relation to Non-Point or Diffuse Sources**

Information Contained in the PRTR	Origin of the Information
Estimate of Emissions Related to On Road Transportation[26]	Transportation Planning Secretariat Ministry of Transportation and Telecommunications
Estimate of Emissions Related to Agricultural Burns	National Forestry Corporation (area affected by fire)
Estimate of Emissions Related to Forest Fires	National Forestry Corporation (vegetation area affected by forest fires[27])
Estimate of Emissions Related to Urban Fires	*Carabineros de Chile* (Chilean Police) (number of cases due to urban fires[28])
Estimate of Emissions Related to Residential Firewood Combustion, in Urban and Rural Areas	CASEN Survey and population projections done by the National Institute of Statistics (INE by its acronym in Spanish)

Source: Ministry of the Environment, Chile.

8.3 Who must report and what must be reported?

The different sectoral legislations establish the reporting thresholds for the sectors, activities or sources that must report environmental information to the different sectoral systems related to point sources.

The table below presents the reporting thresholds related to each environmental component, along with the sectoral legislation and the sectors involved.

[26] It includes the emissions inventory for [22] cities with a transportation model (SECTRA by its acronym in Spanish), plus the estimate of emissions through a simplified methodology for five cities without a transportation model.

[27] The data include the type of vegetation affected by forest fires: trees, shrubs, and grasslands.

[28] The number of cases correspond to a police event of a criminal nature, informed to the competent courts of justice through a police report.

Table 7. **Reporting Thresholds for Environmental Information from Point Sources**

Environmental Component	Responsible Institution	Legislation	Number of Facilities[29]
AIR	**Ministry of Health**	Supreme Decree N° 138/2005 MINSAL Resolution N°15.027/ 1994 (RM)	2005: 1.067 2006: 1.946 2007: 2.467 2008: 3.295 2009: 4.010 2010: 4.525 2011: 5.044 2012: 5.385 2013: 5.449 2014: 3.202 2015: 4.563 2016: 5.073
	Superintendency of the Environment	Supreme Decree N° 13/2011 MMA	2015: 29 2016: 38[30]
	Superintendency of the Environment	Supreme Decree N° 28/2013 MMA	2016: 7[31]
WATER	**Superintendency of the Environment**	Supreme Decree N° 90 MINSEGPRES Supreme Decree N° 80 MINSEGPRES Supreme Decree N° 46 MINSEGPRES	2005: 47 2006: 468 2007: 892 2008: 825 2009: 795 2010: 767 2011: 763 2012: 865 2013: 788 2014: 809 2015: 847 2016: 858
	Superintendency of Sanitation Services	Supreme Decree N° 90 MINSEGPRES Sanitation Companies	
SOIL	**Ministry of the Environment**	Supreme Decree N° 1/2013 MMA	**SINADER Municipal:** 2014: 216 2015: 203 2016: 237 **SINADER Industrial:** 2014: 3.587 2015: 5.037 2016: 5.166

[29] The number of quantified facilities corresponds to the facilities that reported pollutant releases or transfers or wastes in compliance with the identified legislation.

[30] In order to improve the statistical quality of the data, it was determined to use the emissions reported by 38 facilities in the Information System for Thermoelectric Power Plants (SICTER by its acronym in Spanish), in compliance with Supreme Decree N° 13/2011 of the MMA.

[31] Using data reported by seven facilities, in compliance with Supreme Decree N° 28/2013 of the MMA.

Thresholds	Sectors and Equipment Involved
Industries with power generators of over 20kW and industrial or heating boilers with a fuel energy consumption greater than 1 Megajoule per hour.	Paper and Pulp Production, Primary and Secondary Foundries, Thermoelectric Power Plants, Cement, Lime, and Gypsum Production, Manufacture of Glass, Manufacture of Ceramic Products, Iron and Steel Industry, Petrochemistry Industry, Asphalt Production, Power Generators, Boilers
Industries with electricity generation units, made up of boilers or turbines, with a thermal power greater than or equal to 50 MWt	Thermoelectric Power Plants
Facilities corresponding to copper foundries and arsenic-releasing sources	Foundries and Arsenic-Releasing Sources
Facilities that qualify as Industrial Facilities according to article 3.7 of Supreme Decree N° 90/2000, Supreme Decree N° 80/2006, section 8 of article 4 of Supreme Decree N° 46/2002.	Agriculture, Hunting, Forestry and Fishing, Mineral Extraction, Manufacturing Industries, Others that generate ILWs
SINADER: Facilities that annually generate or receive over 12 tons of non-hazardous wastes, as well as wastes managed by municipalities or outsourced by them.	Energy Generation, Agriculture, Livestock and Forestry Industry, Retail, Mineral Extraction (except for massive mining residues), Others that generate non-hazardous wastes

> continues

Environmental Component	Responsible Institution	Legislation	Number of Facilities[29]
SOIL			**SINADER Recipients:** 2014: 208 2015: 269 2016: 265 **SINADER Sludge:** 2014: 140 2015: 153 2016: 159
TRANSFERS	**Ministry of Health**	Ministry of Health Supreme Decree N° 148/2003 MINSAL SIDREP: According to Supreme Decree N° 148/2003 of the MINSAL, which approves the Sanitation Regulation on the Management of Hazardous Wastes, Title VII of the Hazardous Wastes Reporting and Follow Up System.	**SIDREP Generator:** 2006: 169 2007: 656 2008: 1.164 2009: 1.475 2010: 1.844 2011: 2.215 2012: 2.739 2013: 3.115 2014: 3.962 2015: 5.366 2016: 6.114 **SIDREP Recipient:** 2006: 19 2007: 36 2008: 50 2009: 61 2010: 68 2011: 74 2012: 76 2013: 81 2014: 86 2015: 97 2016: 103
	Superintendency of Sanitation Services	Supreme Decree N° 609 MOP	2005: 1.264 2006: 1.537 2007: 1.786 2008: 1.628 2009: 2.137 2010: 1.963 2011: 1.860 2012: 1.989 2013: 2.009 2014: 1.797 2015: 2.021 2016: 1.643

Source: Ministry of the Environment, Chile.

Thresholds	Sectors and Equipment Involved
SIDREP Art. 84, it is mandatory to report the Transportation of Hazardous wastes over 12 kilograms of acutely toxic wastes and over 12 tons of hazardous wastes that present any other hazard feature.	Agriculture, Hunting, Forestry and Fishing; Mineral Extraction (except for massive mining residues); Manufacturing Industries; Others that generate hazardous wastes
Facilities that qualify as Industrial Facilities according to article 3.7 of Supreme Decree N° 90/2000, Supreme Decree N° 80/2006, section 8 of article 4 of Supreme Decree N° 46/2002, and section 3.4 of Supreme Decree N°609/1998.	Agriculture, Hunting, Forestry and Fishing; Mineral Extraction; Manufacturing Industries; Others that generate ILWs

8.4 Organization of information obtained from point sources

In 2014, sectors were established to organize the information obtained from stationary sources, based on, but adapting them to the situation of the country's productive sectors, the nine categories of the Swedish Pollutant Release and Transfer Register[32] (Energy supply, Metal production, Mineral extraction, Chemical production, Waste & wastewater, Paper & wood products, Livestock & fish farming, Food production and Other activities). Thus, a total of 18 categories was prepared, better representing the situation of Chilean industries. Once the categories to be used had been established, it was defined that the first criterion would be the International Standard Industrial Classification of All Economic Activities (ISIC) entered by the Facility Representative in the system. Then, for facilities where the ISIC does not adequately characterize the activity, additional information is sought, such as the facility's geographic location, the company it belongs to or the name the user gave to the facility, among other details, to assign it to the category or sector that best represents it.

[32] Website that may be accessed at https://utslappisiffror.naturvardsverket.se/en/Search-in-map/

Agricultural burn | Ministry of the Environment

Table 8. **PRTR Sectors and Description**

Sector/ Category	Description
Metal Production	Facilities that carry out metal foundry and metallurgy tasks.
Paper and Pulp Industry	Facilities that carry out tasks related to the paper industry, such as pulp plants, forestry companies, and paper production in general.
Chemical Production	Facilities that carry out tasks related to the production of chemical products (does not include pharmacies).
Electric power transmission and distribution	Facilities that carry out tasks related to energy distribution and transmission (does not include energy generation).
Mineral Extraction	Facilities considered as mines and quarries.
Energy Generation	Facilities that carry out tasks related to energy generation (does not include distribution and transmission).
Municipality	Autonomous corporation governed by public law that manages a commune.
Water Supply	Facilities considered as potable water supply plants (does not include wastewater treatment plants, since they are included in the Waste Management category).
Food Production	Facilities that carry out tasks related to food production from raw materials (does not include those related to fishing, since they are included in the Fishing category).
Fuels	Facilities considered as fuel storage, distribution, and reception sites.
Manufacturing Industry	Facilities that carry out tasks related to the products industry.
Transportation	Facilities that carry out transportation services.
Construction and Real Estate	Facilities considered as construction companies or concessionaries.
Agriculture, Livestock, and Forestry Industry	Facilities considered as crop lots and fields.
Fishing	Facilities that carry out tasks related to fishing and the production of food from fishing.
Waste Management	Facilities considered as wastewater treatment plants, final waste destinations, recycling companies, among others.
Retail	Facilities that carry out tasks related to any activity of selling or purchasing of goods.
Other Activities	Facilities that are not considered in the previous categories (such as education, administration, restaurants, health, and banks, among others).

Source: Ministry of the Environment, Chile.

Dissemination at Escuela Militar subway station | Marcos Serrano Ulloa

09 PRTR ONE-STOP SHOP

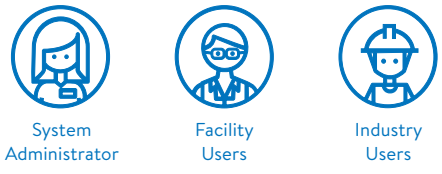
The PRTR in Chile has undergone a permanent updating and improvement process. In this context, the implementation of the PRTR One-Stop Shop is aimed at enhancing and facilitating the reporting of information for data reporters, particularly harmonizing data from their input, in order to ensure their quality and traceability.

In addition to improving the quality of the data, the One-Stop Shop System is part of the recommendations made by the OECD to reduce the duplication of reports requested by the State from the industries and because of the need for integration with sectoral systems for this purpose.

The legal basis for this System was established in the PRTR Regulation, which defines as one of the objectives of the PRTR "generating a One-Stop Shop system as a single access and reporting form in order to concentrate the information that needs to be reported in a database that will allow their harmonization and facilitate their submission by data reporters." Thus, since March 4, 2014 a dry run period of the One-Stop Shop System began, which lasted until its mandatory operation on May 2 that same year.

Figure 8. **Phases in the Development of the PRTR One-Stop Shop, 2011-2013**

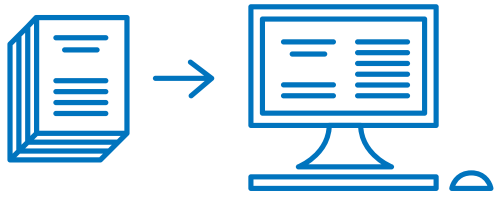
1 PHASE



One-Stop Shop Users

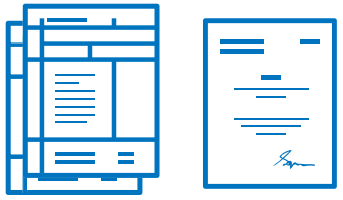
In 2011, the development of the One-Stop Shop began in three phases. During this first phase, the profiles of One-Stop Shop users were created, generating profiles for system administrators, industry users (responsible and delegates of the sectoral systems) and facility users. These were associated with a business name and georeferenced. The National Waste Reporting System (SINADER by its acronym in Spanish) was also developed.

2 PHASE



Integration and harmonization of the information from sectoral systems managed by the Ministry of Health (MINSAL by its acronym in Spanish) and the Superintendency of Sanitation Services (SISS by its acronym in Spanish). During this phase, resources were concentrated to achieve the harmonization of the information contained in the System for Reporting Air Emissions (F-138) and the Hazardous Waste Reporting and Tracking System (SIDREP by its acronym in Spanish), both of the MINSAL. The SISS self-control and supervision systems related to pollutant release and transfers from the discharge of liquid waste into the sewerage system are integrated, as well as the PROCOF system for ILWs emissions into marine and continental waters generated by sanitation companies.

3 PHASE



The production and investment forms were developed, along with the monitoring and control costs (Environmental Protection Expenditure – GPA by its acronym in Spanish), with the aim of preparing environmental performance indicators. The Annual Affidavit was also created.

Source: Ministry of the Environment, Chile.

9.1 Gradual incorporation of the sectoral systems into the PRTR One-Stop Shop

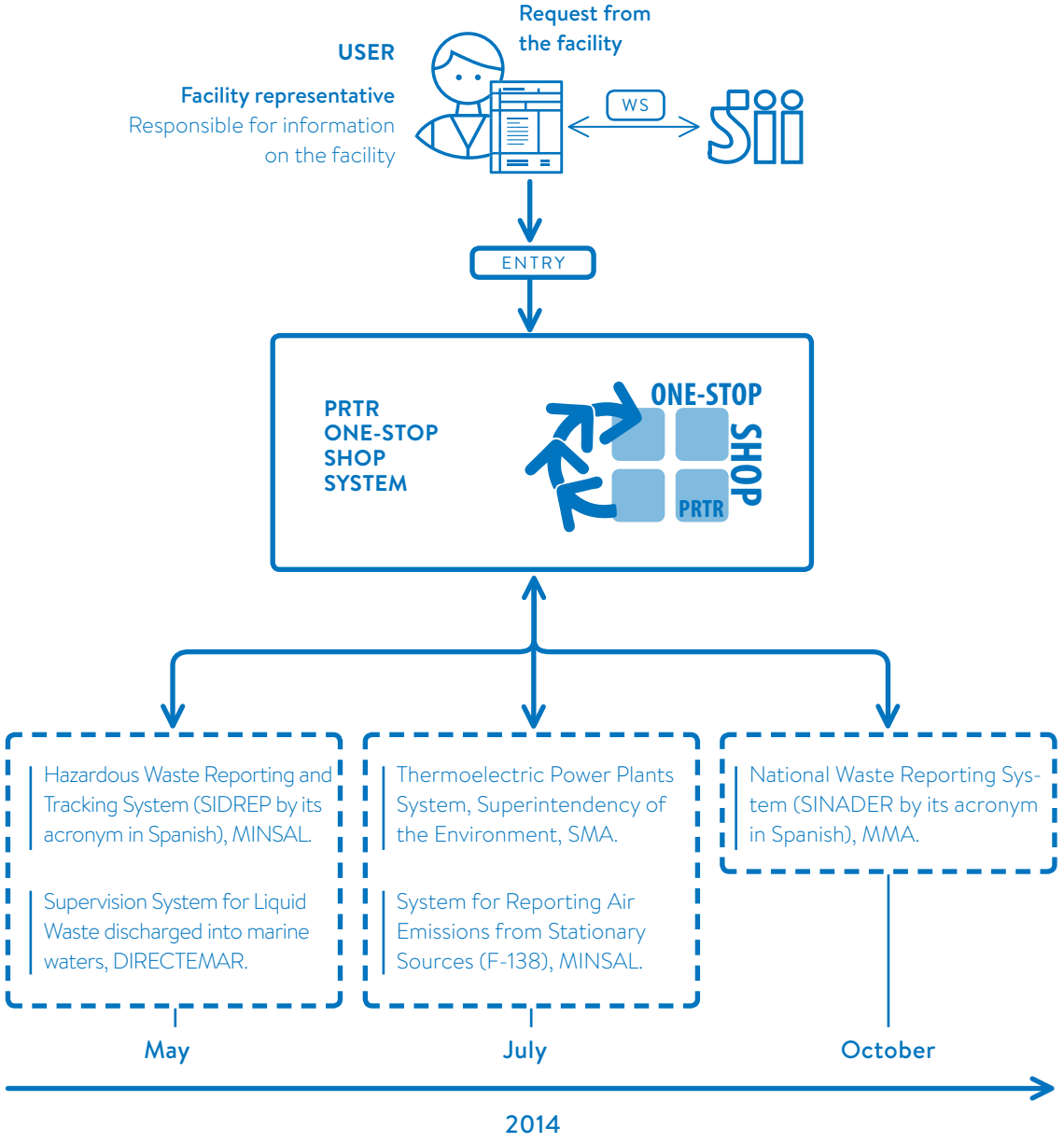
The implementation of the One-Stop Shop System (VU by its acronym in Spanish) brought about a change in the way of reporting for data reporters, since during 2014 different sectoral portals disabled the access to their platforms, in order to have reports submitted exclusively through the VU of the PRTR.

The beginning of the One-Stop Shop System on May 2, 2014 included the integration of the first sectoral systems into the portal, corresponding to the Hazardous Waste Reporting and Tracking System (SIDREP by its acronym in Spanish) and the DIRECTEMAR Supervision System for overseeing Liquid Waste discharged into marine waters. Both enabled the compliance with Supreme Decree N°148/2003 MINSAL and Supreme Decree N°90/2000 MINSEGPRES, respectively.

Later on, during July 2014, the Information System for Thermoelectric Power Plants was integrated, based on the provisions of Supreme Decree N°13/2011 MMA. Subsequently, on July 31, 2014 the System for Reporting Air Emissions from Stationary Sources (F-138) was integrated, in accordance with Supreme Decree N°138/2005 MINSAL.

Finally, on October 30, 2014 the National Waste Reporting System (SINADER by its acronym in Spanish) was integrated in compliance with articles 26, 27, and 28 of Supreme Decree N°1/2013 MMA, which requires generators, municipalities and recipients to report their waste (not required to report by other regulation) by March 30 of the following year.

Figure 9. **Schematic of Integration of Sectoral Systems into the One-Stop Shop System, 2014**



Source: Ministry of the Environment, Chile.

9.2 Impact of the Operationalization of the One-Stop Shop System

The implementation of the One-Stop Shop System enabled having a more precise outlook of the distribution of industrial activities throughout the country and their environmental behavior. This information was largely obtained through the definition of the Facility concept[33], contained in the PRTR regulation, given that it required a large number of facilities unknown until then to register in the One-Stop Shop System.

Prior to the implementation of this system, the exact location of all pollutant emitting or waste generating facilities (required to report under some legislation) was unknown, since several companies reported information only through their headquarters or all reports were harmonized through a branch of the company. There were even extreme cases in which the company in charge of the transportation of hazardous waste did the reporting paperwork for the facility. Thus, the facility concept allowed to overcome large deficiencies of the different Sectoral Systems before the implementation of the One-Stop Shop System. Because there was no system to standardize addresses, different addresses were provided for each Sectoral System, even for the same facility. That made the harmonization of facilities a tough endeavor and, therefore, resulted in a deficient and complex supervision, which also affected the evaluation of public policies in this matter.

[33] Facility: Premises or shop where one or more economic activities are carried out in which raw materials or the materials used are transformed, or where they are not transformed essentially but give origin to new products, and this process generates emissions, waste and/or pollutant transfers; as well as any other activities directly related with those that have a technical link with the activities carried out at the same venue and may have repercussions on the generation of emissions, waste and/or pollutant transfers.

Figure 10. **Example of the Merging of a Same Facility with Different Addresses**

Code	Systems	Name	Address	Commune	Region
4586107	DS13	Central Candelaria	Camino vecinal Parcela 148 Sitio 11	Moztazal	Libertador General Bernardo O'higgins
6888	F138	Colbún S.A.	P.P La Candelaria S/N	Moztazal	Libertador General Bernardo O'higgins
87106	SIDREP	Colbún	Parcela 148	Moztazal	Libertador General Bernardo O'higgins
5440834	SINADER	Candelaria	Camino Vecinal Moztazal Sitio 11	Moztazal	Libertador General Bernardo O'higgins
245119		Central Moztazal	Sitio 11 calle S/N	Moztazal	Libertador General Bernardo O'higgins

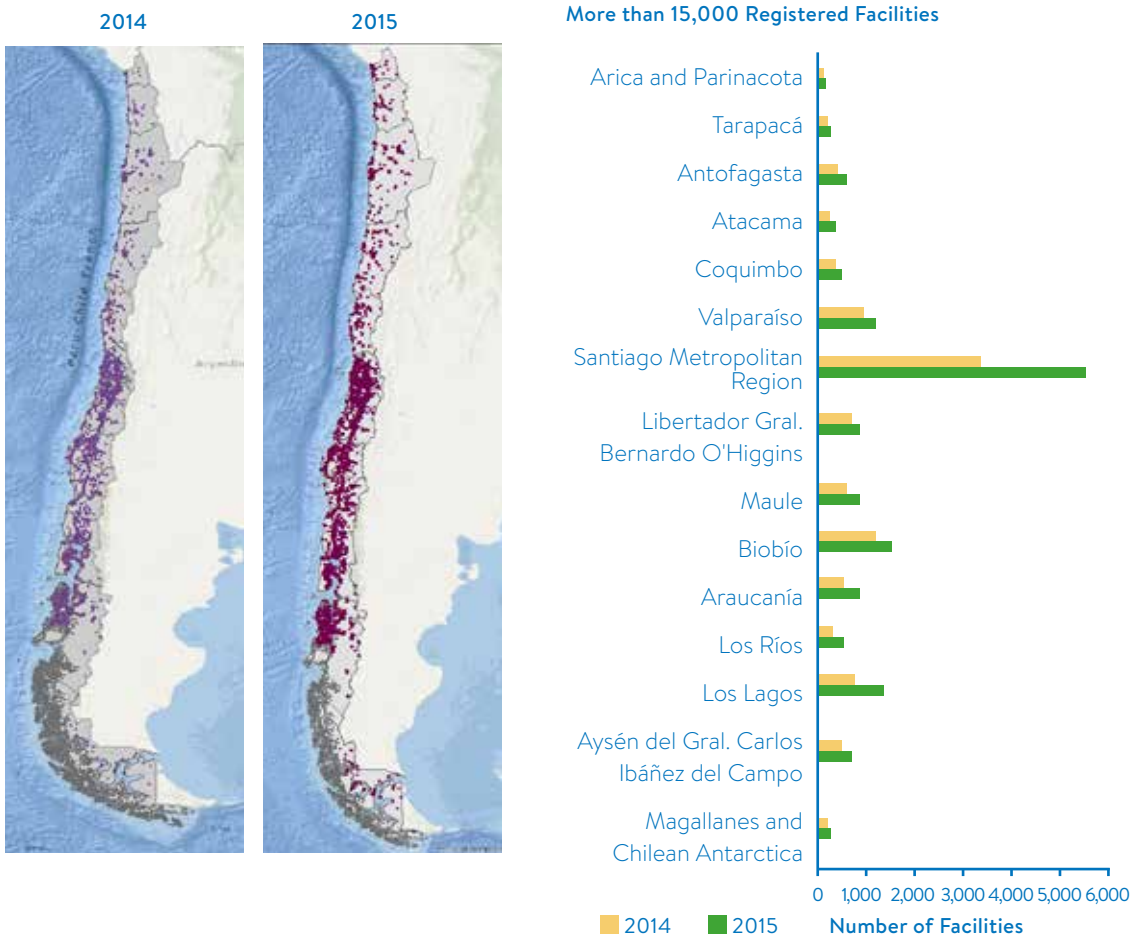
Same facility, different addresses

Code	Systems	Name	Address	Commune	Region
87106	VU, DS13, SIDREP, F138, SINADER	Central Candelaria	Camino vecinal Parcela 148 Sitio 11	Moztazal	Libertador General Bernardo Ohiggins

Source: Ministry of the Environment, Chile

On March 4, 2014, when the dry run of the One-Stop Shop System began, nearly 250 facilities completed the registration. By August that same year, the figure had increased to 6,500 facilities, and after the integration of the Sectoral System for Reporting Air Emissions (F-138), by December 2014 there were already 10,000 facilities and nearly 22,000 users registered in the PRTR's VU system.

Figure 11. **Facilities Registered in the PRTR One-Stop Shop System in 2014 and 2015**



Source: Ministry of the Environment, Chile.

9.3 Access to the One-Stop Shop System

The procedure for accessing the One-Stop Shop System was established through Exempt Resolution N°1.139/2014[34] of the MMA. This resolution specifies the legal duties and responsibilities of the Facility Representative[35] appointed by the company. It also provides details on how to place a request for access to the PRTR's VU, the procedures for updating the facility's information in the system (changing the Facility Representative and Legal Representative), the deadlines to submit production forms, environmental protection expenditures, Annual Affidavit and SINADER.

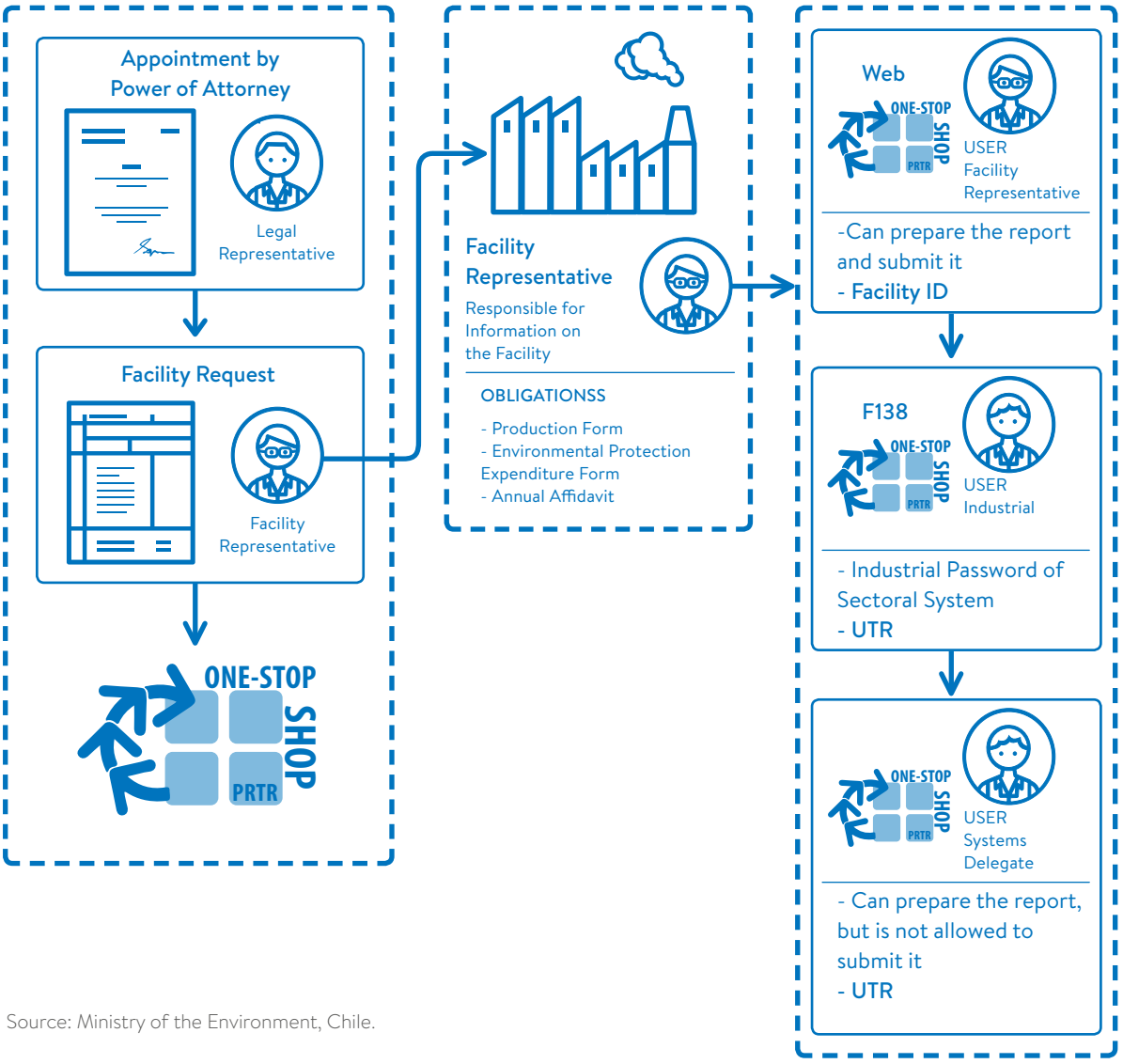
This resolution enabled organizing the registry of facilities, which begins with the request placed in the PRTR's VU through a single access form, in addition to the submission of documents with established formats available on the web portal, thus avoiding having companies register with each service with competence on environmental matters.

Overall, large companies have professionals with expertise in environmental matters that were in charge of the sectoral reports to comply with the legislation or they outsourced their services without much control over the information being reported by third parties. However, in the One-Stop Shop System, it is necessary for the Facility Representative, appointed by the Legal Representative of the company through power of attorney, to control and conduct a comprehensive review of the reports to comply with environmental legislation and the information reported in the different sectoral systems, in order to avoid sanctions once the Annual Affidavit has been done.

[34] http://vu.mma.gob.cl/index.php?c=home , published on January 20, 2014.

[35] The Facility Representative is responsible for the veracity of the information reported. That is, he or she has the obligation to not fake or intentionally omit data, which is verified in the Annual Affidavit.

Figure 12. **Flow to Access the One-Stop Shop System**



Source: Ministry of the Environment, Chile.

Presentation and coordination with regions of the country | Ministry of the Environment

10 PUBLICATION AND DISSEMINATION OF PRTR INFORMATION

Just as with the rest of the PRTRs at the global level, in the case of Chile one of its objectives is to facilitate access to information on emissions, waste and pollutant transfers, to promote the knowledge of this information among citizens, and to make it available in a transparent manner. Hence, the information contained in the PRTR is public.

In order to achieve this objective, the Pollutant Release and Transfer Register has a web portal, www.retc.cl, through which it makes available to citizens all the compiled information on emissions, waste, and pollutant transfers obtained from the compliance with national legislation (emission standards, prevention and decontamination plans, regulations related to waste, environmental qualification resolutions) or any other regulation that establishes the obligation to report on these matters. In addition, it houses information obtained from the estimate of emissions from unregulated point and non-point or diffuse sources, as well as information regarding emissions, waste, and pollutant transfers for which the country has accepted the obligation to measure, quantify or estimate them, in compliance with the provisions of international conventions ratified by Chile that are currently in force.

The information contained in the PRTR is presented in an aggregated and in a disaggregated manner, so that data on emissions, waste generation and destination, and pollutant transfers can be accessed in the PRTR electronic portal by:

A. Facility and emission or discharge unit;

B. Geographic location;

C. Political-administrative division of the country;

D. Productive sectors;

E. Types of sources, point or diffuse;

F. Owners of companies that report through the PRTR's One-Stop Shop System, as applicable;

G. Pollutant, substance, or waste;

H. Environmental component receiving the pollutant, substance, or waste;

I. Destination of wastes and transfers;

J. Environmental performance indicators by productive sector.

With this information, the PRTR Regulation establishes, also, the Ministry of the Environment's obligation to prepare an annual Consolidated Report on Pollutant Release and Transfer, previously mentioned as the annual PRTR Report.

Before making information public in the web portal and in the Consolidated Report on Pollutant Release and Transfer, when submitting information on emissions, waste, and/or transfers through the One-Stop Shop, the Facility Representative will electronically sign an affidavit to assert the veracity of the information submitted and the declaration that no omissions have been made.

Up to 2017, 11 reports have been published, and they are available to citizens through the website (both for browsing and for downloading in PDF format) and in printed copies for consultation in the office of the Ministry of the Environment and in its Regional Ministry Secretariats.

10.1 PRTR web portal: available modules and functions

The PRTR web portal, www.retc.cl, has different modules associated with the information contained in the database of the Pollutant Release and Transfer Register. Through these modules, it is possible to access the information contained in the PRTR, which can be downloaded. In addition, in the portal there is a section with the latest PRTR news, as well as announcements about PRTR training and publications.

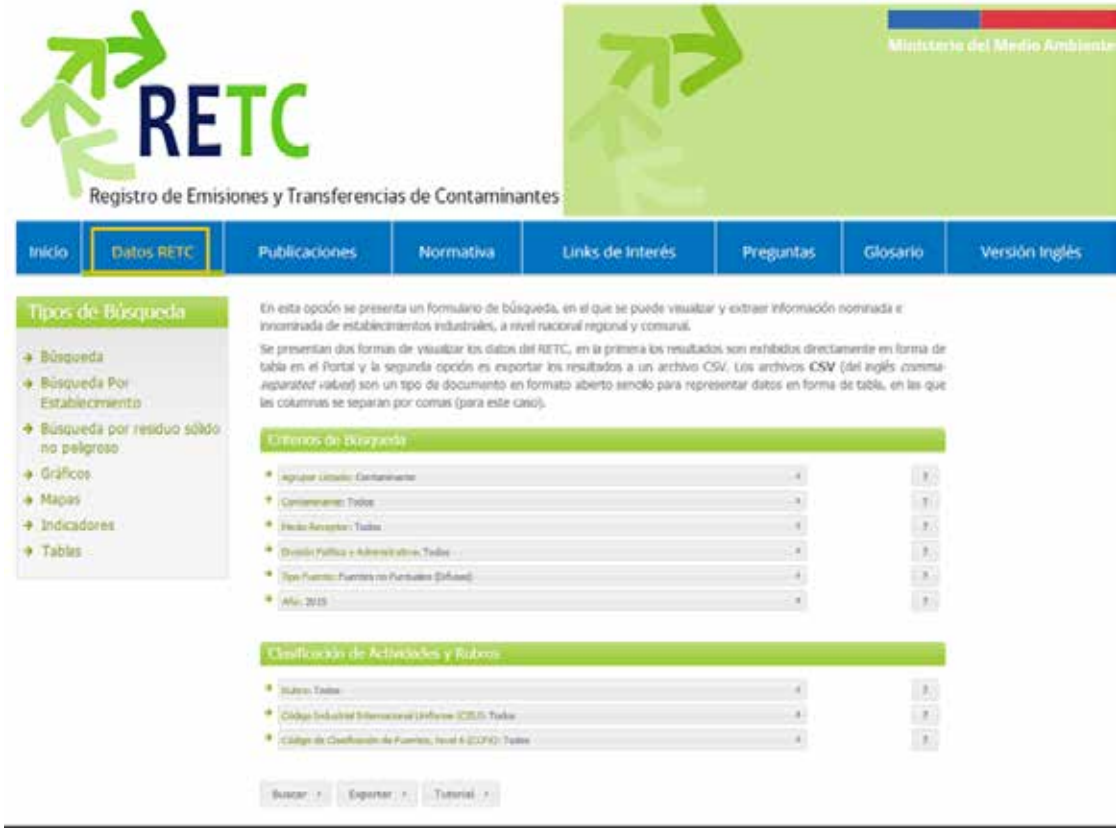
PRTR DATA MODULE

The PRTR Data module contains the information reported by point sources in the different sectoral systems existing in the One-Stop Shop System, in addition to the information associated to the estimate of emissions from non-point sources. Information can be searched for based on different criteria, such as facility, pollutant, recipient medium, political-administrative division, type of source, sector, International Standard Industrial Classification of All Economic Activities (ISIC), Source Classification Code: Level 6 (SCC6), and year.

Once the search has been conducted, selected data can be viewed in either one of two ways: in the first the results are shown directly as a table, while the second option allows exporting the data as an Excel or csv file.

A broad image of the PRTR Data module, from which the information contained can be downloaded, according to the established search criteria, is presented below.

Figure 13. **PRTR Data Module in Web Portal (www.retc.cl)**



Source: https://www.retc.cl

PUBLICATIONS MODULE

This module houses the Reports of the Pollutant Release and Transfer Register, which can be viewed in web version or downloaded as PDF files. The first PRTR report was published in 2007 with data from 2005, and the publication is updated each year. In addition, this model has the Methodological Guide for Estimating Air Emissions from Point and Mobile Sources, published in 2009 with the aim of strengthening the available infrastructure for estimating emissions and standardizing estimate methodologies at the national level.

Figure 14. **Publications Module in Web Portal (www.retc.cl)**

Source: https://www.retc.cl

LEGISLATION MODULE

In this module, the user can open and/or download current environmental legislation associated with the Pollutant Release and Transfer Register. This section is linked to the website of the Library of the National Congress, section Chilean Law, which houses the list of Laws, Decrees and Resolutions related to the PRTR.

Figure 15. **Legislation Module in Web Portal (www.retc.cl)**

Source: https://www.retc.cl

Finally, it is worth mentioning that the www.retc.cl portal contains other modules with information related to the Pollutant Release and Transfer Register, which are constantly updated: Interesting Links, Questions, Glossary, and an English version of the PRTR Data section.

10.2 Training program

In order to support the high demand of users of the One-Stop Shop and the impact of its implementation in the country, training workshops are held each year in all regions of the country, with the participation of over 3,000 users in some years.

At present, the PRTR training programs are aimed at two areas: One focused on the regulated sector, training users on how to submit their reports according to the obligations they must comply with, and another one focused on citizens, in order to facilitate access to information and thus comply with the requirements of transparency and promotion of an active participation in the country's environmental management.

Along with that, permanent efforts are being made to provide timely information to system users through different media, including manuals and instructions that may be downloaded from the One-Stop Shop portal, support videos for reporting, e-learning, frequently asked questions, contact form, in-person training and other ways of communication, for example, through the PRTR regional focal points and the Citizen Information Offices in each Regional Ministry Secretariat of the Ministry of the Environment throughout the country. There is also a telephone help desk to guide users and clarify doubts on reporting.

Image 1. **Training program workshops held in 2014 and 2015**

Training in the Magallanes and Chilean Antarctica Region.

Training in the Antofagasta Region.

Source: Ministry of the Environment, Chile.

Marcos Serrano, speaker of the PRTR One-Stop Shop System workshop | Ministry of the Environment

Paper industry storage yard | Ministry of the Environment

11 CONTRIBUTION OF THE PRTR TO ENVIRONMENTAL MANAGEMENT

The data contained in the Pollutant Release and Transfer Register are used to prepare environmental indicators related to issues such as air pollution, generation and transportation of hazardous and non-hazardous waste, and the environmental condition of bodies of water. One example is the reports on the state of the environment that, according to article 70, letter ñ of Law 19.300 must be prepared by the Ministry of the Environment. In addition, as a member country of the Organisation for Economic Co-operation and Development (OECD), Chile must report environmental information to that organization in order to assess its environmental performance. Thus, the Ministry of the Environment uses the data contained in the Pollutant Release and Transfer Register related to the 130 pollutants and parameters available.

Some of the contributions of the PRTR to environmental management are mentioned below:

11.1 State of the Environment Report (SOE)[36]

The State of the Environment Report (SOE) is a tool to monitor the state of the different environmental components, as well as the actions and public policies implemented to address the issues that affect them. According to the provisions of Law 19.300, it is a publication done every four years, based on the information validated by the different public agencies with competence on environmental matters.

The last report, published in 2016 and made up of 17 chapters[37], in addition to including the main environmental components, addresses new issues in response to the country's features and characteristics, as well as the challenges it faces to reach the goal of sustainable development. Likewise, it incorporates a table with the main targets set by the country, linked to the environmental objectives at the international level.

The information contained in this report corresponds to different public agencies that form the Inter-Institutional Committee on Environmental Information[38], which seeks to coordinate the public sector's efforts in terms of environmental information.

[36] http://sinia.mma.gob.cl/wp-content/uploads/2017/12/IEMA2016-English.pdf

[37] Drivers; Gender and Environment; Native Peoples; Environmental Institutional Framework; Environmental Management Tools; Green Growth; Air; Climate Change; Ozone Layer; Environmental Noise; Skies for Astronomical Observation; Land; Waste; Green Urban Infrastructure; Biodiversity; Water; Natural Events and Environmental Disasters.

[38] Exempt Resolution N° 179 dated March 15, 2012, whose aim will be to provide and validate environmental information required to meet the information products that the Ministry of the Environment must prepare, in accordance to the provisions of Law 19.300, as well as the different international Agreements, Conventions and Treaties signed by the country on environmental matters.

In addition to the contribution of public agencies with competence in environmental matters, this report also receives inputs from scientists, academic institutions and private companies, which helps achieve the necessary synergy between public policy and the different sectors of society.

The State of the Environment Report is prepared based on the GEO (Global Environment Outlook) methodology of the former United Nations Environment Programme (UNEP), now UN Environment. The aim of this integrated environmental assessment is to incorporate different stakeholders of society in order to generate a participative process.

The GEO methodology is a process that analyzes environmental change, its causes and impacts and the responses to them through policies or actions by society, providing information for decision makers and support through early warning. In addition, the GEO is a communication process aimed at raising awareness about environmental issues, providing options for action.

Although the country does not have the necessary information to address all aspects included in this methodology, the State of the Environment Report enables identifying the information gaps and aspects that need to be strengthened for a better understanding of the environmental issues faced by the country, their consequences for people, and the preparation of public policies that safeguard the quality of the environment and the health of the population.

This report is composed of over 200 indicators, structured based on the Drivers-Pressures-State-Impact-Responses (DPSIR) model, which seeks to show the causal relations between the environment and human activities.

The report includes indicators related to:

DRIVERS
(Underlying Causes)
They are indirect factors or variables behind the more specific pressures that affect the environment.

PRESSURES
(Direct Causes)
They are direct factors or variables that affect the state of environmental components, either individually or collectively. These pressures may be of an anthropic nature or can be caused by natural processes.

STATE
(Problem)
It refers to the situation of the environmental components, as a result of drivers and pressures.

IMPACT
(Effects)
The state of the environmental components is linked to different types of impacts, both on the quality of life and on the people's health, as well as on the ecosystem functions of the environment, frequently called "ecosystem services."

RESPONSES
It refers to the actions carried out by both the authorities and society at large, either to reduce environmental impacts or to adapt to them. These actions will affect the state of the environmental components, as well as the pressures and drivers.

The use of the PRTR data for the SOE is presented in the following table, following the GEO methodology.

Table 9. **Contribution of the PRTR to the State of the Environment Report**

SOE Chapters	PRTR Contribution (DPSIR)
Environmental Noise	N/C
Skies for Astronomical Observation	N/C
Land	N/C
Waste	P - S - R
Green Urban Infrastructure	N/C
Biodiversity	P
Water	P
Natural Events and Environmental Disasters	S - I
Ozone Layer	S
Drivers	P
Gender and Environment	N/C
Native Peoples	N/C
Environmental Institutional Framework	R
Environmental Management Tools	R
Green Growth	R
Air	P - R
Climate Change	P - R

N/C: No Contribution

Source: Ministry of the Environment, Chile.

11.2 Annual State of the Environment Report (REMA by its acronym in Spanish)[39]

The Annual State of the Environment Report (REMA by its acronym in Spanish) is an annual publication, as established in article 70, letter ñ) of Law 19.300. It provides an update of the country's environmental indicators and statistics that enable monitoring the evolution of the main environmental components as well as of other issues that affect the country in this area at the regional level.

Each year, new topics are incorporated. Thus, in 2017 two new chapters were included: native peoples and natural events and environmental disasters, revealing their importance for the country's environmental management. In addition, this publication contains indicators corresponding to the Sustainable Development Goals (SDGs), an initiative that Chile is part of and which seeks to achieve the three dimensions -economic, social and environmental- of sustainable development in a balanced manner. To that end, the United Nations proposed a work agenda for 2030. Its implementation in Chile is the responsibility of a National Council formed by the Ministries of: Foreign Affairs (which presides it); Economy, Development and Tourism; Environment; and Social Development, which houses the technical secretariat.

Likewise, as recommended by the Organisation for Economic Co-operation and Development (OECD), and as part of the work committed within the framework of the SDGs, this report enables incorporating indicators that measure the progress achieved by the country regarding green growth, one of the biggest challenges in the medium and long terms, in order to promote economic development that ensures the existence of the resources and services they offer for people's quality of life.

The REMA is prepared based on information from different public agencies with competence on environmental matters that are part of the Inter-Institutional Committee on Environmental Information, which seeks to coordinate the public sector's efforts in terms of environmental information. It is important to point out that this Committee has an important role in terms of the work to achieve the SDGs in environmental issues. The last REMA, from 2017, is composed of 97 indicators, 1640 of which were prepared based on PRTR information.

[39] http://sinia.mma.gob.cl/estado-del-medio-ambiente/

[40] I-CP4: Evolution of the vehicle fleet, I-CA5 Composition of $PM_{2.5}$, NOx and SO_2 air emissions by type of source, I-CA6 $PM_{2.5}$ emissions by region and type of source, I-CA7 NOx emissions by region and type of source, I-CA8 SO_2 emissions by region and type of source, I-RE1 Percentage of generated waste, by origin at the national level, I-RE2 Composition of waste by origin and disposal at the national level, I-RE3 Percentage of waste generation, by origin according to ISIC, I-R4 Percentage of waste generation at the regional level, by origin, I-RE5 Valuation and final disposal of wastes at the regional level, I-B2 Number of fires and affected area, I-B3 Land use area affected by forest fires, I-B4 Native forests affected by forest fires, by forest subtype, I-A4 Total releases by region into groundwater bodies, I-A5 Total releases by region into surface waters, I-ED7 Air emissions due to forest and urban fires between 2011 and 2015.

11.3 Environmental accounts

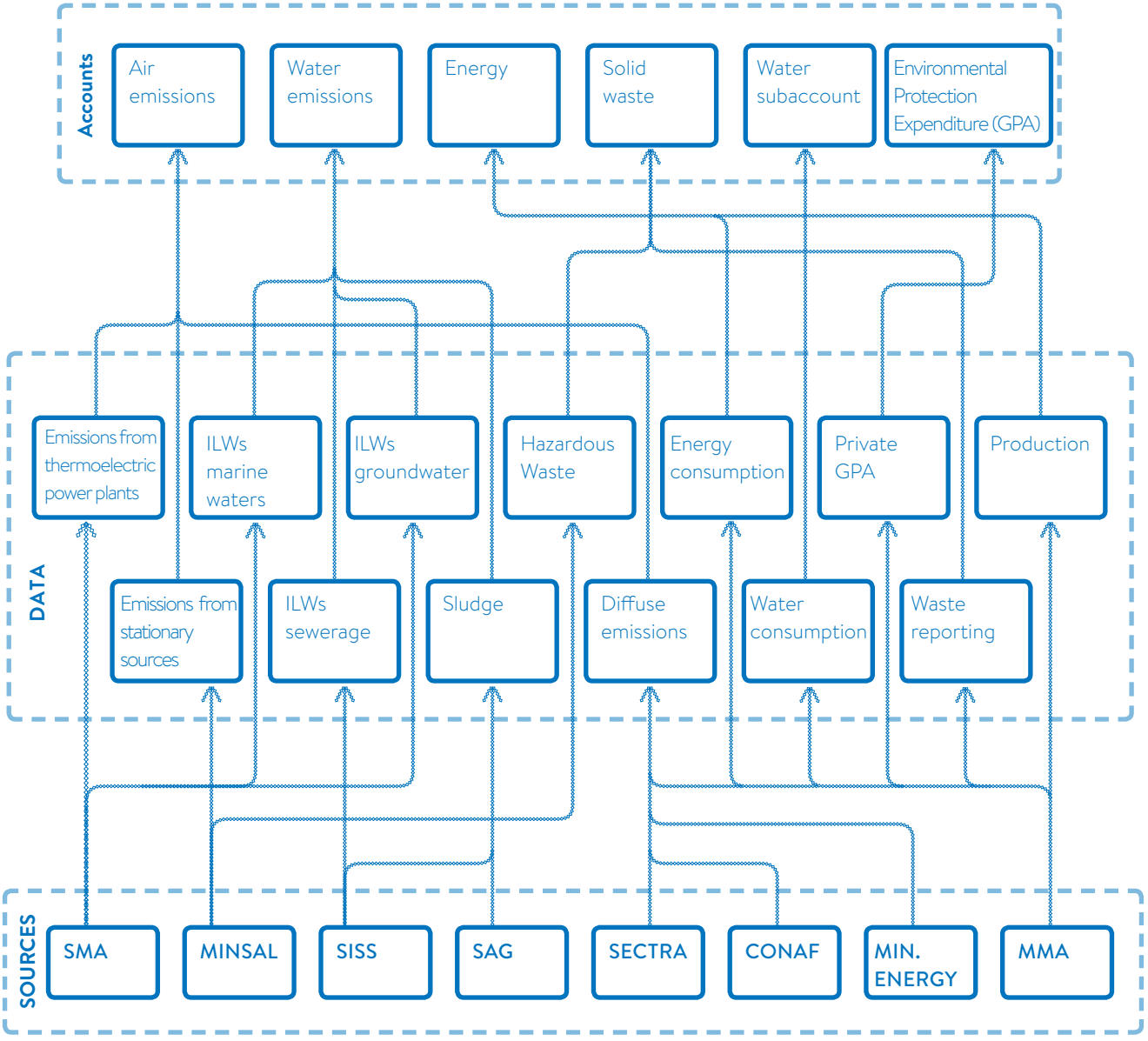
Chile's economic development is based on the exploitation and intensive use of natural resources, which causes significant impacts on the environment and people's quality of life. Because of that, having consistent environmental information is not only relevant for an effective monitoring of the state and use of natural resources and ecosystems, but also for informing on the country's environmental issues to citizens who are ever more aware of their rights.

In this context, Chile has advanced in the preparation and development of environmental indicators. However, these have not been able to truly reflect the relationship between environmental and economic variables. The development of integrate economic-environmental accounts enables linking the characteristics of the economic system with impact they generate on environmental heritage in order to have a more precise vision of the development strategy that has been followed and, consequently, to support public management.

The System of Environmental-Economic Accounting (SEEA) (UN, 2012) is a system of second-generation satellite accounts that includes the environmental variable. This system incorporates a registry of the natural productive capital (environmental assets) and its changes over time, broadening the approach of the central framework of the System of National Accounts. In addition, the United Nations is focused on building a third-generation system that includes ecosystems. This is the Experimental Ecosystem Accounting (SEEA-EEA), which includes ecosystems as part of the national accounting system. Experimental Accounting does not provide specific recommendations to compile ecosystem accounts, but they constitute a starting point for the future development of a global system that includes them.

The PRTR is an important source of information for the preparation of pilot environmental accounts being developed by the country. The following figure presents the pilot environmental accounts currently under preparation and the data provided by the PRTR with the information sources.

Figure 16. **Schematic of the Environmental and Economic Accounts**



Source: Ministry of the Environment, Chile.

Metal foundry | Ministry of the Environment

Recycling spot | Triciclos

12 CONTRIBUTION OF THE PRTR TO ENVIRONMENTAL PUBLIC POLICY

12.1 Green taxes

From the economic perspective, a green tax is established based on the economic value associated with the environmental damage generated by pollutant emissions of an economic activity. All studies identified particulate matter (PM), nitrogen oxides (NOx), sulphur dioxide (SO_2) as the main pollutants that affect human health (OMS, 2005: EPA, 2015) and carbon dioxide (CO_2) as the main pollutant that affects global warming (IPCC, 2014). Because of that, green taxes were placed on the emissions of these pollutants.

Article 8 of Law 20.780[41], enacted in September 2014, establishes an annual fiscal benefit tax -both for individuals and legal entities- on air emissions of PM, NOx, SO_2, and CO_2 produced by facilities whose stationary sources -boilers and/or turbines-, either individually or together, add up to a nominal thermal power[42] greater than or equal to 50 MWt (Megawatts thermal), considering the higher limit of the fuel's energy value.

12.2 Green taxes on local pollution

In the case of air emissions of local pollutants (PM, NOx, and SO_2), the green tax is calculated based on a formula whose objective is estimating the differentiated damage generated by emissions. Because of this, the tax is greater in communes declared as saturated or latent in terms of pollutants and where the population is larger.

The tax per ton is calculated based on a formula whose objective is to determine the specific damage of emissions from industrial processes according to the situation of each area where the emissions are generated. Thus, it is possible to estimate the tax on environmental damage due to pollution, taking into consideration the territorial component of environmental management. Under this model, the tax per ton varies depending on the commune where the affected facility is located. The formula recognizes, for example, that a ton of pollutant released in a saturated area, with a large population, generates greater damage than the same ton of emissions in an area without a high con-

[41] https://www.leychile.cl/Navegar?idNorma=1067194 Tax Reform that modifies the tax system.

[42] Nominal thermal power: It is the thermal power calculated based on the information on nominal fuel consumption, determined by the technical specifications of the design or engineering developed by the manufacturer and/or constructor, and the higher heat power of the fuel being used, determined according to the values published in the annual Energy Balance prepared by the National Energy Commission (Source: Supreme Decree N°18/2016).

centration of pollutants and where the population is smaller[43]. Indeed, the tax is weighted according to the air quality coefficients for each zone. The weight ranges from a value of 1 for areas below the standard, 1.1 for latent areas, and 1.2 for saturated areas[44].

Thus, the green tax on local pollutants is established through the following calculation formula:

$$T_{ij} = 0{,}1 \cdot CCA_j \cdot CSC_{PCI} \cdot Pob_j$$

Where:

T_{ij}: Tax by ton of pollutant "I" released in commune "j", in USD $/Ton.

CCA_j: Air quality coefficient of commune "j". This is a coefficient associated with the area where the affected facility is located, and it depends on a legal declaration by the Ministry of the Environment.

CCA	Saturated Area	Latent Area
	1.2	1.1

CSC_{PCI}: Per capita social cost of pollution from pollutant "i", with the following values:

Pollutant	Cost (USD $)[45]
PM	0.9
SO_2	0.01
NOx	0.025

POB_j: Population of commune "j", according to the official projection for each year, estimated by the National Institute of Statistics (INE by its acronym in Spanish).

[43] Modified by Law 20.899, 8/2/2016, which simplifies the Tax Reform and eliminates the Emission Concentration Factors, introducing the air quality coefficient.

[44] The facilities may be located in three types of areas:
• Area under a standard: Where the concentration of pollutants (in the air, water or soil) is below the 80% value of the corresponding environmental quality standard.
• Latent area: Where the measurement of the concentration of pollutants in the air, water or soil is between 80% and 100% of the value of the corresponding environmental quality standard.
• Saturated area: Where one or more environmental quality standards are exceeded. The declaration of areas as latent or saturated is done by the Ministry of the Environment by Supreme Decree (Art. N°43 Law 19.300 on the General Environmental Framework).

[45] Values determined from the research of the Ministry of the Environment on the environmental damage related to air pollution. (Methodological Guide for the Preparation of Analyses of Social and Economic Impacts - Guía Metodológica de Elaboración de AGIES, 2013).

12.3 Green taxes on global pollution: CO_2 emissions

The tax on carbon dioxide (CO_2) emissions affects the same facilities defined for the tax on local emissions, except for stationary sources operating based on non-conventional renewable generation media whose primary energy source is biomass[46].

The tax on carbon, as designed in Chile, has been devised as a starting point to internalize and raise awareness of the damage generated by the emission of greenhouse gases (GHG).

In the case of CO_2, a tax of USD $5 is set for each ton released. The value was determined based on the social cost of carbon dioxide estimated by the Ministry of Social Development[47].

This is a small amount in comparison to those of other countries and jurisdictions. Nevertheless, during this first stage, it was considered that a relatively low tax enables its implementation by: (i) facilitating the adaptation of regulated sector; (i) increasing its social acceptance; and (iii) setting up the institutional infrastructure that supports it. That is, the carbon tax, as applied in Chile, has been devised as a starting point to internalize and raise awareness of the damage generated by the emission of greenhouse gases (GHG), by initiating the discussion of pricing instruments for pollutants in general and for carbon in particular.

The methodology for valuing the social cost of carbon was recently modified to move from the use of the market price for carbon as an estimate of its social cost towards a shadow price, based on the analysis of the marginal costs of reducing carbon dioxide that enable meeting Chile's mitigation targets under the Paris Agreement.

The new methodology has elevated the cost of CO_2 to CLP $ 21,687 (Ministerio de Desarrollo Social, 2017). This value, equal to USD $32[48] is closer to the marginal cost of the damage of the

[46] The exemption applies exclusively for the emission of CO_2.

[47] When the law was drafted, the Ministry of Social Development considered a social cost of CLP $2,213 (Ministerio de Desarrollo Social, 2014), which was then rounded to the value of USD $5 per ton. For details about the social pricing methodology and about the social price of CO_2, please see: http://sni.ministeriodesarrollosocial.gob.cl/evaluacion-iniciativas-de-inversion/evaluacion-ex-ante/metodologias-precios-sociales/

[48] Estimated figure according to the price of the observed dollar on January 2, 2017 (CLP $667.29)

pollutant according to the 'Report of the High-Level Commission on Carbon Prices' (CPLC, 2017). In addition, it is consistent with the targets established in the Paris Agreement, which consider as costs of CO_2 values ranging between USD $40 and USD $80 for 2020 and USD $50 and USD $100 for 2030. Likewise, a price of USD $40/ton of CO_2 will be set as the social cost for the evaluation of all public sector investments.

This green tax was set through Supreme Decree N°18/2016 of the MMA, which establishes in Article 5 "content of the register", that the entities required to register must report to the Ministry of the Environment, through the One-Stop Shop System of the Pollutant Release and Transfer Register (PRTR), established in Title IV of Supreme Decree N°1, of 2013, of the Ministry of the Environment.

The information is obtained from the declaration in the electronic forms indicated by Supreme Decree N°138/2005 of the Ministry of Health and the characterization of the Generating Units mentioned in Supreme Decree N°13/2011 of the Ministry of the Environment, Emission Standard for Thermoelectric Power Plants.

Paper manufacturing process | Ministry of the Environment

TablE 10. **Register of Boilers and Turbines in the PRTR**

A. Identification of the natural or legal person(s), owners of the source, through their first names, last names, unique tax reference number, address, telephone and electronic mail.

B. Identification of the facility in the One-Stop Shop (VU by its acronym in Spanish) of the Pollutant Release and Transfer Register (PRTR).

C. Registration number (F138) of the emission source.

D. Registration number in the database of the competent sanitary authority (only if it exists).

E. Type of source.

F. Brand of the source.

G. Model of the source.

H. Year of manufacture.

I. Year of installation.

J. Serial or chassis number of the source.

K. Internal number (number given by the manufacturing company).

L. Identification of the duct or chimney associated with the source.

M. Nominal thermal power of the source.

N. Nominal fuel consumption

O. Fuel(s) used.

P. Higher heating value of a fuel, when applicable.

Q. Description of the source and of the process carried out.

R. Operation hours of the source.

S. Emissions control system.

T. Loading capacity of the source.

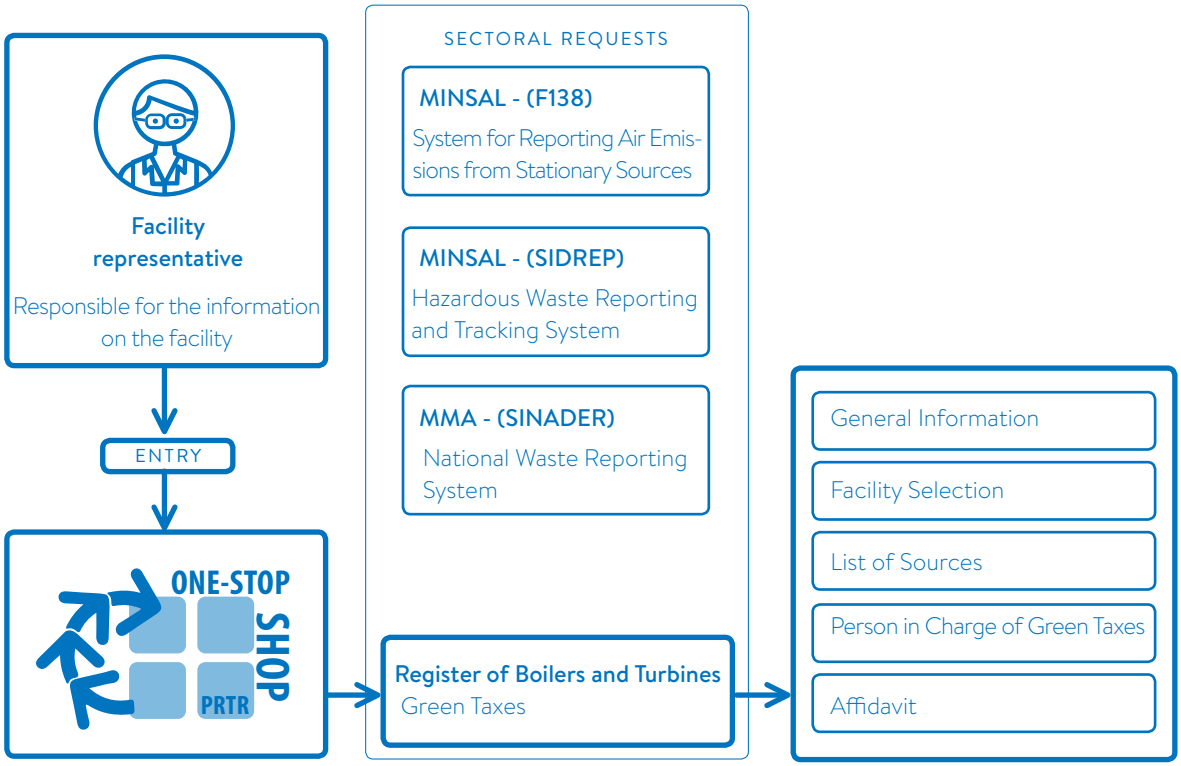
U. Date when operation began.

V. Identification of the perimeter of the facility, its georeferenced location with UTM projection, datum WGS 84 and Coordinate 19, in shape or KML format.

Source: Ministry of the Environment, Chile.

No facility that is not registered in the PRTR can report its emissions. It is important to highlight that the facilities affected by the green tax that are already registered do not need to be registered again. They are only required to verify the information already reported.

Figure 17. **General Diagram of the Reporting by Boilers and Turbines in the Register**



Source: Ministry of the Environment, Chile.

Boiler room | Ministry of the Environment

12.4 Framework Law for Waste Management, Extended Producer Responsibility and Promotion of Recycling (EPR Law)

The Promotion of Recycling Law seeks to reduce waste generation and promote its reuse, recycling, and other types of valuation. This legislation promotes a development model in which product waste becomes a value resource that is once again incorporated into the production chain as raw material or energy and, therefore, nothing is wasted. Thus, progress is being made towards a circular economy, following the lead of several developed countries, in order to protect people and the environment, reduce the environmental impact related to the extraction of raw materials and the use of natural resources, increase the useful life of products, prevent waste generation, and promote ecodesign.

Among other provisions, the law introduces in Chile the concept of Extended Producer Responsibility (EPR), an economic instrument for waste management that forces producers (or importers) of the elements defined as "priority products" to organize and finance the management of waste originated by those products. Chile is the first South American country to implement this instrument, which was already in operation in Europe in the 1990s.

During a first stage, there are six products defined as a priority: motor oils; electrical and electronic appliances; containers and packaging; tires; batteries and vehicle batteries.

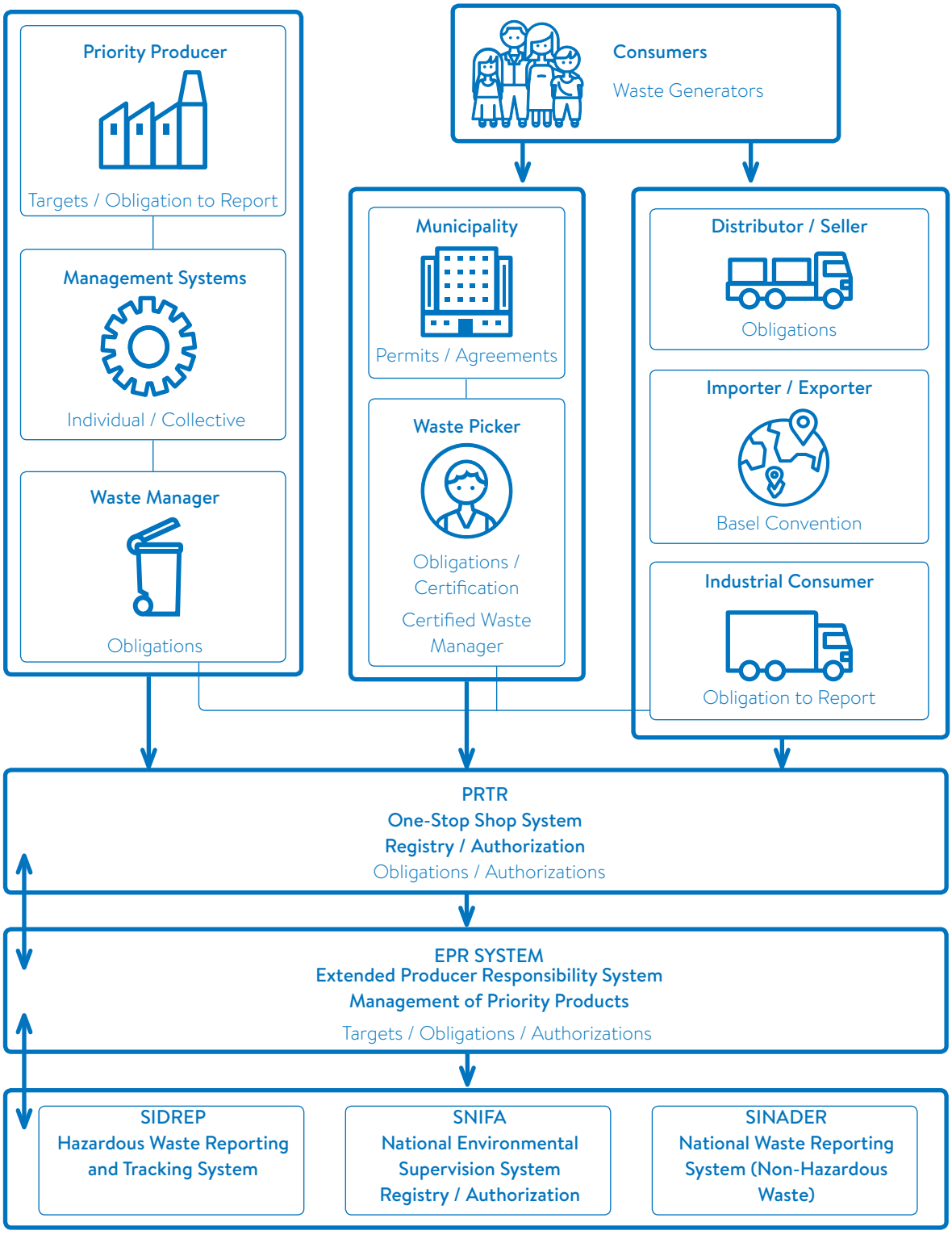
Article 37 of this Law also defined the Pollutant Release and Transfer Register as its information system, which will contain and enable managing information on:

- Producers of priority products.
- Authorized management systems and the parts that integrate them.
- Distributors or sellers of priority products, whenever applicable.
- Reception and storage facilities.
- Authorized waste managers, including municipalities and associations of municipalities that have current agreements with a management system for the management of waste from priority products, and waste pickers, in accordance with article 32.
- The achievement of collection and valuation targets.
- Any other information established in the corresponding regulation.

The regulation will establish the content and operation of the Register, which must ensure the commercial and industrial confidentiality of the information.

The Ministry will make sure that the information contained in the Register be disseminated in an easily understandable language through its website. The registry of producers of priority products and waste pickers began in 2017.

Figure 18. **General Diagram of the Law for Promoting Recycling and Extended Producer Responsibility in the PRTR**



Source: Ministry of the Environment, Chile.

Thermoelectric power plant | Ministry of the Environment

13 PRTR AS A CONTRIBUTION TO ESTABLISH INDICATORS FOR THE TARGETS OF THE SUSTAINABLE DEVELOPMENT GOALS (SDGS)

There is a significant challenge of achieving an inclusive and sustainable development, that enables reducing not only poverty, but also inequalities, with policies that: foster innovation, safeguarding biological diversity and natural resources; take into consideration a solid and democratic institutional development; apply a systemic and intersectoral approach that improves the living conditions of people; is guided by the principle of "growing to include and including to grow", seizing everyone's potential; and is consistent with the commitment of the 2030 Agenda: "Leaving no one behind."

Chile confirms its commitment to the 2030 Agenda and the integrated, indivisible, global and nonhierarchical nature of the Sustainable Development Goals (SDGs), safeguarding the principles of inclusion and participation of all in their implementation.

The country highlights the responsibility shared between the State, civil society and economic agents for an economic and social development, within a framework of inclusive economic growth, decent and productive labor, with the protection and advocacy for human rights, through policies that are non-fragmented, redistributable and with an emphasis on social investment; regulating the people's rights in the markets, boosting social cohesion, non-discrimination, and environmental sustainability.

In order to measure the progress on the achievement of the SDG targets, more attention is currently being given to the use of the information compiled and available on the PRTR to assess the advances towards the global prevention of pollution and sustainability.

Although the demand for the use of the information compiled and available on the PRTR to assess the progress towards sustainability is increasing, there are few documents on how the data of the PRTR can be used as a tool within the field of sustainability. In fact, the term "PRTR" is rarely associated or used with the terms "sustainability" or "sustainable development" in the same publications.

It is certainly possible to identify specific objectives among the SDGs for which the data of the PRTR can be used to assess the progress towards their achievement. However, its role is broader, to the extent that it is possible to assert that it is very likely that several of the SDGs, along with their objectives, will be met if a PRTR has been implemented in the country. The reason behind this is that the PRTR's general objective is to reduce pollution and, in order to achieve this objective, it links environmental well-being with industrial and social development. There is a coincidence of principles here with the 2030 Agenda and the Sustainable Development Goals.

Generally, it can be said that the implementation of new PRTRs, and the adaptation of the existing PRTRs, serves as a tool to quantify the indicators for the achievement of several of the SDGs.

Figure 19. **Sustainable Development Goals (SDGs)**

Of the 17 Sustainable Development Goals (SDGs), the PRTR could contribute information for the development of indicators in at least 6 of them that could allow the quantification of the achievement of their targets.

Table 11. **PRTR Information for the SDGs**

Objective	Target	PRTR Information
	3.9.1 Mortality rate attributed to household and ambient air pollution.	PRTR – Air emissions from point and non-point or diffuse sources.
	6.3.1 Proportion of wastewater safely treated.	PRTR – Total greywater generated by industries. PRTR – Destination of discharged industrial water.
	9.4.1 CO_2 emission per unit of value added.	PRTR – CO2 Emissions from stationary sources (The PRTR is proposed as the source for complementary data for GHG inventories).
	11.4.1 Total expenditure (public and private) per capita spent on the preservation, protection and conservation of all cultural and natural heritage.	PRTR – Environmental Protection Expenditure Form, Private Environmental Protection Expenditure.
	11.6.1 Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated by cities.	PRTR – SINADER, Number of household and similar solid wastes and Non-hazardous Industrial Waste.
	12.4.2 Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment.	PRTR – SIDREP, Number of hazardous wastes in a safe destination.
	12.5.1 National recycling rate, tons of material recycled.	PRTR – SIDREP, Number of valued and/or recycled wastes.
	13.2.1 Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development.	PRTR – Green taxes for stationary sources.

Source: Ministry of the Environment, Chile.

Storage area for waste awaiting valuation | Triciclos

14 A FUTURE OUTLOOK

The consolidation of the PRTR as an instrument for environmental management with the publication of its regulation has led to the dramatic increase of the demands for the expansion of its content and functions. This, by far, justifies the continuity of the development of this tool, but it is also necessary to take into account the following key aspects:

DESCENTRALIZATION OF THE PRTR

The decentralization of the management of the PRTR towards the Regional Ministry Secretariats (SEREMIs by their acronym in Spanish) of the Ministry of the Environment throughout the country is a key aspect so that the increasing demand for this tool does not cause the system to collapse. The SEREMIs must take on a leading role in its administration and exploitation, in accordance to the realities and interests of each region.

SYSTEM SECURITY

Guaranteeing the security of the system is another one of the key challenges for the PRTR to be reliable, in order to preserve the confidentiality of the information that is reported and avoid possible hacker attacks.

This issue will gain more relevance each day, and it requires the consideration of a group of elements that range, for example, from the code lines up to the safety of the data center.

INTEGRATION WITH THE GOVERNMENTAL ONE-STOP SHOP

It is only logical for the State to request information from individuals and legal entities just once; avoiding duplicate requests. In addition, the access and communication regarding the obligations of data reporters with the State should converge at a common entry point with their Single Password already implemented in the country. To that end, common standards and guidelines are required that allow said integration.

MANAGEMENT FOR INDUSTRIES

Data reporters should not only declare according to the requirements of the current regulations. It is convenient that the PRTR, based on those same reports, allows them to access management modalities for their establishments that benefit their performance, that differentiate them from those that do not comply with the legal obligations and/or that highlight their best actions regarding said commitments.

TOOL FOR CITIZENS

The new communication technologies and social networks must be part of the PRTR platforms. Therefore, it is necessary to adapt to these realities and offer alternatives that provide relevant information for each citizen depending on the environment surrounding them, in a fast and simple manner.

TOOL TO OPERATE WITHIN THE MARKETS

Opening and developing markets, especially those related to carbon, among other possibilities, is also an important aspect of globalization and the efforts to combat climate change. This requires common standards that provide the assurance that the transactions are based on common systems of measurement, reporting, and verification (MRV by their acronym in Spanish) and are, therefore, comparable.

This becomes more relevant each day, since the economic instruments for environmental management are a reality from which our country cannot fall behind and which it must foster with strength and determination.

PRTR Team | Marcos Serrano Ulloa

15 BIBLIOGRAHY

14.031, Iso Standard (2013).

Environmental management - Environmental performance evaluation – Guidelines.

Ambiente, C. N. (2008).

Actualización del inventario de emisiones atmosféricas de las comunas de Temuco y Padre Las Casas Año Base 2013.

AMBIOSIS S.A. (2010).

Estudio Diagnóstico Plan de Gestión Atmosférica - Región de Valparaíso, Construcción de un Inventario de Emisiones Regional. Valparaíso, Chile: SEREMI del Medio Ambiente.

Calderón, S., & Guerra, J. (2002).

Inventario de Biomasa y Contabilidad de Carbono. Valdivia, Chile: Universidad Austral de Chile.

CARB. (Californian Air Resources Board) (2005).

Area-Wide Source Methodologies, Section 7.17 Agricultural Burning and Other Burning Methodology. Sacramento, California, United States: Californian Air Resources Board.

CENMA. (Centro Nacional del Medio Ambiente) (2010).

Actualización del Inventario de Emisiones de Contaminantes Atmosféricos en la Región Metropolitana. Región Metropolitana, Chile: CONAMA.

COCHILCO. (Comisión Chilena del Cobre) (2007).

Gestión del Recurso Hídrico y la Minería en Chile- Diagnóstico para Mesa Público-Privada Nacional.

Corporación de Desarrollo Tecnológico, Cámara Chilena de la Construcción. (2015).

Medición del consumo Nacional de Leña y otros Combustibles sólidos derivados de la madera.

Desert Research Institute. (1999).

Reconciling Urban Fugitive Dust Emissions Inventory and Ambient Sources Contribution Estimates. Reno.

ECLAC. (Economic Commission for Latin America and the Caribbean). (2003).

Organisation for Economic Co-operation and Development (OECD) Recommendation from 20 February 1996 C/(96)41/ Final, amended on 28 May 2003, C(2003)87.

EPA. (Enviromental Protection Agency) (2009).

Compilation of Air Pollutant Emission Factors, Volumen I: Stationary Point and Area Sources. Washington, D.C.: United States. Enviromental Protection Agency.

GreenLabUC y Política Ambiental DICTUC S.A. (2016).

Implementación de Indicadores Relacionados con los Objetivos de Desarrollo Sostenible (ODS) y otras Iniciativas-Informe Final.

IPCC. (Intergovernmental Panel on Climate Change) (2006).

Good Practice Guidance for Land Use, Land-Use Change and Forestry. Hayama, Japan: The Intergovernmental Panel on Climate Change.

Launhardt, T. (2000).

Verbrennungsversuche mit naturbelassenen biogenen Festbrennstoffen in einer Kleinfeuerungsanlage: Emissionen und Aschequalität ; [Abschlussbericht]. Múnich, Germany: BaySt*M*LU.

MMA. (Ministerio del Medio Ambiente) (2007 to 2016).

Reportes del Registro de Emisiones y Transferencias de Contaminantes, Santiago, Chile. Departamento de Información Ambiental.

Nussbaumer, T. (2006).

Results from Tests on Wood Stoves and revised Recommendations for Emission Limit Values for Chile. Zurich, Germany: CONAMA and COSUDE.

PRTR. Swedish Pollutant Release and Transfer Register
https://utslappisiffror.naturvardsverket.se

Rogge, W., Hildemann, L., Mazurek, M., & Cass, G. (1998).

Sources of Fine Organic Aerosol. 9. Pine, Oak, and Synthetic Log Combustion in Residential Fireplaces. Pasadena, California: Environmental Engineering Science Department, California Institute of Technology.

SERPRAM. (2006).
Medición de Artefactos de uso Residencial que Operan con Biomasa para Apoyar Procesos Regulatorios Ambientales. Región Metropolitana: CONAMA.

UNEP. (United Nations Environment Programme) (2005a).
Standardized Toolkit for Identification and Quantification of Dioxin and Furan Releases. Geneva, Switzerland: United Nations Environment Programme.

UNEP. (United Nations Environment Programme) (2005b).
Standardized Toolkit for Identification and Quantification of Mercury Releases. Geneva, Switzerland: United Nations Environment Programme.

UNITAR. (United Nations Institute for Training and Research) (1997).
Series of guides for the implementation of a National PRTR Design Project:
- Implementing a National PRTR Design Project: A Guidance Document (http://prtr.unitar.org/site/document/1219)
- Preparing a National PRTR Infrastructure Assessment, UNITAR Guidance Series for Implementing a National PRTR Design Project, Supplement 1 (http://prtr.unitar.org/site/document/1258)
- Designing the Key Features of a National PRTR System, UNITAR Guidance Series for Implementing a National PRTR Design Project, Supplement 2 (http://prtr.unitar.org/site/document/1259)
- Implementing a PRTR Pilot Reporting Trial, UNITAR Guidance Series for Implementing a National PRTR Design Project, Supplement 3 (http://prtr.unitar.org/site/document/1237)
- Structuring a National PRTR Proposal, UNITAR Guidance Series for Implementing a National PRTR Design Project, Supplement 4 (http://prtr.unitar.org/site/document/1239)

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17 ANNEXES

Annex 1. List of Pollutants and Parameters Included in the PRTR

Nº	Pollutants included in the PRTR
1	Residual mineral oils unfit for intended use
2	Oils and fats
3	Sulphurated hydrogen / hydrogen sulfide (or TRS)
4	Aldrin
5	Aluminum
6	Arsenic
7	Arsenic, arsenic compounds
8	Benzene
9	Beryllium compounds
10	Polychlorinated biphenyl (PCB)
11	Boron
12	Bromochloromethane, Appendix C, Group III
13	Methyl bromide, Appendix E, Group I
14	Cadmium
15	Cadmium, Cadmium compounds
16	Fully halogenated CFCs (others), Appendix B, Group I
17	Cyanide
18	Non-organic cyanides
19	Organic cyanides
20	Chlordane
21	Chlorofluorocarbons (CFCs), Appendix A, Group I

> continues

Nº	Pollutants included in the PRTR
22	Chlorides
23	Copper
24	Copper, copper compounds
25	Antimony compounds
26	Hexavalent chromium compounds
27	Mercury compounds
28	Lead compounds
29	Selenium compounds
30	Zinc compounds
31	Inorganic flourine compounds, excluding calcium flourine
32	Phosphorus organic compounds
33	Volatile Organic Compounds
34	Hexavalent chromium
35	Total Chromium
36	Any substance in the polychlorinated dibenzofurans group
37	DDT (1,1,1-Trichloro-2,2-bis(4-chlorophenyl) ethane)
38	Polychlorinated dibenzofurans (PCDF)
39	Polychlorinated dibenzodioxins (PCDF)
40	Dieldrin
41	Sulphur dioxide (SO_2)
42	Carbon dioxide (CO_2)
43	Nitrogen dioxide (NO_2)
44	Endrin
45	Polluted containers and vessels that have contained one or more compounds listed in Category II

> continues

Nº	Pollutants included in the PRTR
46	Tin
47	Esters
48	Phenols, phenolic compounds, including chlorophenols
49	Fluorides
50	Total Phosphorus
51	Halons, Appendix A, Group II
52	Heptachlor
53	Hexachlorobenzene
54	Sulphur hexaflouride (SF_6)
55	Hydrobromofluorocarbons (HBFC), Appendix C, Group II
56	Stable hydrocarbons
57	Total hydrocarbons
58	Volatile hydrocarbons
59	Hydrochlorofluorocarbons (HCFCs), Appendix C, Group I
60	Hydrofluorocarbons (HFC)
61	Iron / dissolved iron
62	Phenol index
63	Manganese
64	Mercury
65	Carbonyl metals
66	Methane (CH_4)
67	Methylchloroform (1,1,1-trichloroethane), Appendix B, Group III
68	Mirex
69	Molybdenum
70	Carbon monoxide

> continues

Nº	Pollutants included in the PRTR
71	PM_{10}
72	Nickel
73	Nitrite plus Nitrate (and NOx)
74	Ammoniacal nitrogen (or NH_3)
75	Ozone
76	Total suspended particles (TSP)
77	Pentachlorophenol /PCP
78	Perfluorocarbons (PFC)
79	Lead
80	Asbestos dust and/or fibers, excluding waste from cement-asbestos based construction materials
81	Tarred waste resulting from refining, distillation or any pyrolytic treatment
82	Explosive waste
83	Waste containing cyanides, resulting from thermal treatment and tempering activities
84	Waste resulting from selective collection or segregation of residential solid waste that has at least one hazard characteristic
85	Waste resulting from the manufacturing, preparation and use of chemicals for wood preservation
86	Waste resulting from the manufacturing, preparation and use of biocide products, phytopharmaceutical products and pesticides
87	Waste resulting from the production and preparation of pharmaceutical products
88	Waste resulting from the production, preparation and use of organic solvents
89	Waste resulting from the manufacturing, preparation and use of chemicals and materials for photography
90	Waste resulting from the production, preparation and use of resins, latex, plasticizer or glues and adhesives
91	Waste resulting from the production, preparation and use of inks, dyes, pigments, paints, lacquers or varnishes
92	Waste resulting from the surface treatment of metals and plastics
93	Selenium

> continues

N°	Pollutants included in the PRTR
94	Halogenated organic solvents
95	Organic solvents, excluding halogenated solvents
96	SOx
97	Soils or materials resulting from earthworks in sites contaminated by one of the components listed in Category II
98	Sulphates
99	Sulphides
100	Active substances in Methylene blue
101	Residual chemical substances, nonidentified or new, resulting from research and development or teaching activities whose effects for humans or the environment are unknown
102	Substances and waste containing, or contaminated by, polychlorinated biphenyl (PCB), polychlorinated terphenyl (PCT) or polybrominated biphenyl (PBB)
103	Thallium, thallium compounds
104	Tellurium, tellurium compounds
105	Tetrachloroethene
106	Carbon tetrachloride, Appendix B, Group II
107	Toluene / methylbenzene / Toluole / Phenylmethane
108	Toxaphene
109	Trichloromethane
110	Xylene
111	Zinc
112	Polychlorinated dibenzodioxins and furan (PCDD/F)
113	$PM_{2.5}$
114	NOx
115	Hospital waste
116	Discarded medicines, drugs and pharmaceutical products

> continues

N°	Pollutants included in the PRTR
117	Mixes and emulsions of oil and water or hydrocarbons and water
118	Waste resulting from waste disposal and treatment operations, such as sludge, filters, dust, etc.
119	Acidic solutions or acids in solid form
120	Basic solutions or bases in solid form
121	Halogenated organic compounds, which are not the substances mentioned in this article
N°	**Physical and Biological Parameters**
122	Settling solids
123	Total suspended solids
124	Temperature
125	BOD5
126	PH
127	Foaming power
128	Catalyzers used
129	Fecal or thermotolerant coliforms
130	Total Kjeldahl Nitrogen

Source: Ministry of the Environment, Chile.

Annex 2. Members of the National Coordination Group (GNC by its acronym in Spanish)

National Coordination Group (GNC by its acronym in Spanish)	
Ministry of Defense	National Forestry Corporation (CONAF by its acronym in Spanish)
Ministry of Economy	Chilean Copper Commission (COCHILCO by its acronym in Spanish)
Ministry of Energy	Agriculture and Livestock Service (SAG by its acronym in Spanish)
Ministry of Health (MINSAL by its acronym in Spanish)	National Geology and Mining Service of Chile (SERNAGEOMIN by its acronym in Spanish)
Ministry of Mining	Chilean Internal Revenue Service (SII by its acronym in Spanish)
Ministry of Transportation and Telecommunications (Transportation Secretariat, SECTRA by its acronym in Spanish)	Superintendency of the Environment
Ministry of Public Works (Secretariat for the Environment, Territory and Citizen Participation, SEMAT by its acronym in Spanish)	Superintendency of Sanitation Services (SISS by its acronym in Spanish)
Agency for Sustainability and Climate Change	General Directorate of Maritime Territory and the Merchant Marine (DIRECTEMAR by its acronym in Spanish)
National Statistics Institute (INE by its acronym in Spanish)	General Directorate of Water (DGA by its acronym in Spanish)
In addition, with an advisory nature, it will be integrated by a representative of the following professional and academic institutions and civil society:	Chemical Industry Trade Association of Chile (ASIQUIM by its acronym in Spanish)
	Confederation for Production and Commerce (CPC by its acronym in Spanish)
	Greenpeace Chile
	Terram Foundation

Source: Ministry of the Environment, Chile.

Annex 3. **Countries with PRTR**

Country	Website	Further information
 **Australia**	www.npi.gov.au	OECD
 **Austria**	www.umweltbundesamt.at/prtr/	Part of the Kiev Protocol; E-PRTR; OECD
 **Belgium**	www.health.belgium.be/Aarhus/PRTR	Part of the Kiev Protocol; E-PRTR; OECD
 **Bulgaria**	www.eea.government.bg	Part of the Kiev Protocol; E-PRTR
 **Canada**	www.ec.gc.ca/inrp-npri	CCA; OECD
 **Chile**	www.retc.cl	OECD
 **Croatia**	hnproo.azo.hr/Home.aspx	Part of the Kiev Protocol; E-PRTR
 **Cyprus**	www.prtr.dli.mlsi.gov.cy	Part of the Kiev Protocol; E-PRTR
 **Czech Republic**	www.irz.cz	Part of the Kiev Protocol; E-PRTR; OECD
 **Denmark**	www.mst.dk	Part of the Kiev Protocol; E-PRTR; OECD
 **Finland**	www.ymparisto.fi/fi-FI	Part of the Kiev Protocol; E-PRTR; OECD
 **France**	www.pollutionsindustrielles.ecologie.gouv.fr	Part of the Kiev Protocol; E-PRTR; OECD

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Country	Website	Further information
Georgia	www.prtr-georgia.org	Signatory of the Kiev Protocol
Germany	www.thru.de	Part of the Kiev Protocol; E-PRTR; OECD
Greece		Part of the Kiev Protocol; E-PRTR; OECD
Hungary	eper-prtr.kvvm.hu	Part of the Kiev Protocol; E-PRTR; OECD
Iceland	www.ust.is	E-PRTR; OECD
Ireland	www.epa.ie	Part of the Kiev Protocol; E-PRTR; OECD
Israel	www.sviva.gov.il/English/env_topics/IndustryAndBusinessLicensing/PRTR/Pages/default.aspx	Part of the Kiev Protocol; OECD
Italy	www.eper.sinanet.apat.it	Signatory of the Kiev Protocol; E-PRTR; OECD
Japan	www.nite.go.jp	OECD
Latvia	arcims.lvgma.gov.lv:8082/prtr/viz.jsp	Part of the Kiev Protocol; E-PRTR
Lithuania	gamta.lt	Part of the Kiev Protocol; E-PRTR
Luxembourg	www.environnement.public.lu	Part of the Kiev Protocol; E-PRTR; OECD
Malta	www.mepa.org.mt/eprtr	E-PRTR

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Country	Website	Further information
 Mexico	app1.semarnat.gob.mx/retc/index.htm	CCA; OECD
 Netherlands	www.emissieregistratie.nl	Part of the Kiev Protocol; E-PRTR; OECD
 Norway	www.norskeutslipp.no	Part of the Kiev Protocol; E-PRTR; OECD
 Poland	www.gios.gov.pl	Part of the Kiev Protocol; E-PRTR; OECD
 Portugal	www.apambiente.pt	Part of the Kiev Protocol; E-PRTR; OECD
 Romania	prtr.anpm.ro	Part of the Kiev Protocol; E-PRTR
 Serbia	www.sepa.gov.rs	Part of the Kiev Protocol; E-PRTR
 Slovak Republic	ipkz.shmu.sk	Part of the Kiev Protocol; E-PRTR; OECD
 Spain	www.prtr-es.es	Part of the Kiev Protocol; E-PRTR; OECD
 Sweden	utslappisiffror.naturvardsverket.se	Part of the Kiev Protocol; E-PRTR; OECD
 Switzerland	www.bafu.admin.ch	Parte del Protocolo de Kiev; E-PRTR; OCDE
 United Kingdom	www.gov.uk/guidance/uk-pollutant-release-and-transfer-register-prtr-data-sets	Parte del Protocolo de Kiev; E-PRTR; OCDE
 United States	www2.epa.gov/toxics-release-inventory-tri-program	CCA; OECD

Source: https://prtr.unece.org/prtr-global-map

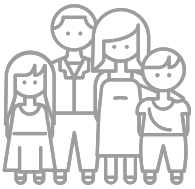
CHILE IN NUMBERS

AREA

Total: 756,102.4 km²

Water (%): 1.07 %

Coastline: 6,435 km²



TOTAL POPULATION

Census: 17,574,003 inhabitants (2017)

Density: 23.24 inhabitants /km²

ENERGY MATRIX 2016

Coal: 45%

Hydropower: 27%

Natural Gas and LNG (liquefied natural gas): 16%

Petroleum Byproducts: 2%

Otrhers: 10%

GROSS DOMESTIC PRODUCT (PPP AND NOMINAL)

PPP

Total (2017): USD $454,344 million

Per capita: USD $24,710

NOMINAL

Total (2017): USD $242,641 million

Per capita: USD $13,196

HDI (2016)

2016: 0.84711 – Very high

PRODUCTIVE SECTOR

Number of Enterprises: 1,074,040 (micro 75.2%, small 20.3%, medium 3.0%, large 1.5%).

- The manufacturing industry accounts for 14.75% of the National GDP.
- The mining sector accounts for 14.2% of the National GDP.
- The agricultural sector accounts for 9.8% of the National GDP.
- The forestry sector accounts for 3.1% of the National GDP.
- The tourism sector accounts for 1.33% of the National GDP.
- The fishing sector accounts for 0.4% of the National GDP.

Sources: Banco Central, INE, ODEPA.

PRTR IN NUMBERS 2016

TOTAL EMISSIONS (air + water):

90,696,238 t

Total Air Emissions: 88,189,947 t

Point Source Emissions: 51,026,065 t

Non-Point Source Emissions:

Transportation: 14,194,340 t
Firewood: 12,318,757 t
Wildfires: 8,825,123 t
Agricultural Burns: 1,824,847 t
Urban Fires: 815 t

Total Non-Point Source Emissions:
37,163,882 t

Total Water Emissions: 2,506,291 t

Emissions into Continental Waters: 2,478,122 t

Emissions into Groundwater: 1,017 t

Transfers into the Sewerage System: 27,152 t

Total Waste: 20,205,701 t

Residential: 6,471,908 t

Industrial: 12,695,987 t

Hazardous: 641,993 t

Sludge: 395,813 t

Total Facilities:

24,423

Total Businesses:

11,746

N° Facility Representatives:

13,326

N° Industrial Users:

29,956

Sources: Ministry of the Environment, Chile, www.retc.cl

MANUAL FOR DESIGNING AND IMPLEMENTING POLLUTANT RELEASE AND TRANSFER REGISTERS (PRTRs): THE CASE OF CHILE © 2017
Ministry of the Environment

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