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Pollution information portals: strengthening access to information on releases of hazardous substances

Report of the Special Rapporteur on the implications for human rights of the environmentally sound management and disposal of hazardous substances and wastes, Marcos Orellana

Summary

Pursuant to Human Rights Council resolution 54/10, the Special Rapporteur on the implications for human rights of the environmentally sound management and disposal of hazardous substances and wastes, Marcos Orellana, presents to the Council his annual thematic report, in which he examines pollution information portals. These portals provide direct and contextual information on emissions and wastes to the public, businesses, regulators and other users. They are thus key to good environmental governance, corporate accountability and the implementation of the right to a clean, healthy and sustainable environment. Despite their potential, a number of States have not established them. Also, a critical assessment reveals shortcomings of certain existing models, including insufficient pollution prevention mandates, the limited scope of the pollutants and activities covered, voluntary instead of mandatory reporting, and lack of integration with other environmental information systems. The report provides recommendations for States to establish and/or strengthen pollution information portals.

I. Introduction

1. Confronting the global pollution crisis demands information on critical questions concerning emissions and the disposal of hazardous substances and wastes – what pollutants and wastes are emitted or disposed of; where; in what quantities; by whom; and with what consequences – these are all decisive questions. Actionable knowledge on these issues enables regulators, individuals and communities, and businesses to take measures to prevent, control and reduce pollution and exposure. Such information is also crucial for the accountability of governments and businesses, and for meaningful public participation in decision-making on environmental matters.[1]

2. The General Assembly, recognizing, in 2022, the human right to a clean, healthy and sustainable environment,[2] called on States and other actors "to adopt policies, to enhance international cooperation, strengthen capacity-building and continue to share good practices in order to scale up efforts to ensure a clean, healthy and sustainable environment for all". Pollution information portals (PIPs) can assist all United Nations Member States in implementation of this right. PIPs are also pivotal tools for advancing the right to science[3] and the right of access to information on emissions and wastes, including information on their environmental and health hazards and risks.

3. While their specific features vary, first-generation PIPs, such as pollutant release and transfer registries (PRTRs), basically are online platforms, accessible to the public, that provide data on the emissions and wastes from industrial and business activities and other sources.

4. In contrast, new generation PIPs are entryways to information. They widen the substantive scope of PRTRs, such as by adding data on resource consumption. They also apply technologies that allow data to be used for purposes in addition to pollution prevention and reduction, such as public health and spatial planning. They reflect good practices, such as integrating PRTRs with other relevant databases, to enhance environmental transparency, public engagement and regulatory effectiveness.

5. While PIPs offer a pathway towards greater transparency and accountability, several obstacles limit their effectiveness. Some barriers include an insufficient pollution prevention mandate, the narrow scope of the pollutants covered, non-mandatory reporting by businesses and other entities, lack of integration with other platforms, difficulties in accessing or understanding the information, and limited public awareness of their existence and participation in their development and use.[4]

6. In the present report, the Special Rapporteur on the implications for human rights of the environmentally sound management and disposal of hazardous substances and wastes explores the functions of PIPs in regard to the right to a clean, healthy and sustainable environment, the right to science and the right of access to information, and identifies good practices in their design and implementation. He also critically assesses limitations and shortcomings of existing models and includes recommendations to help States establish, strengthen or integrate PIPs.

7. The report is informed by a broad consultative process in which the Special Rapporteur invited and received input from United Nations Member States, international organizations, non-governmental organizations, Indigenous Peoples, national human rights institutions, and academics.[5] The Special Rapporteur also organized three online

[1] A/73/188 and A/HRC/37/59.

[2] General Assembly resolution 76/300. See also Human Rights Council resolution 48/13.

[3] The right to enjoy the benefits of scientific progress and its applications, referred to as "the right to science" in the present report, is recognized in article 27 of the Universal Declaration of Human Rights and codified in the International Covenant on Economic, Social and Cultural Rights. See also A/HRC/48/61.

[4] Submission by Poland.

[5] The submissions shared with the Special Rapporteur are available at https://www.ohchr.org/en/calls-for-input/2024/call-inputs-pollution-information-portals-and-right-know-strengthening-access.

consultations in April 2024,[6] as well as a special session during the third meeting of the Conference of the Parties to the Regional Agreement on Access to Information, Public Participation and Justice in Environmental Matters in Latin America and the Caribbean (Escazú Agreement).[7] The Special Rapporteur is grateful to those who shared their expertise, insights and perspectives in their written submissions and at online meetings.

II. Pollution information portals, environmental governance and business responsibilities

8. Various types of PIPs have emerged over time and specific features of the portals vary. All provide users with data or information related to pollution. First-generation PIPs include registers or databases of emissions and wastes that originate from industrial and business activities, and other sources.[8] New generation PIPs, in contrast to simple registers, are the gateway towards information and knowledge on pollution that is easily accessible to regulators, the public and businesses. Therefore, robust PIPs provide context to figures on emissions and wastes, and in this way transform data into actionable information and knowledge for action in order to prevent, control and reduce pollution.

9. A standardized approach towards PRTRs has helped build the information infrastructure that provides access to data and information on pollution, not limited to a specific environmental medium (air, water or land), or to a specific source or type of pollution. This is a key difference to other information systems on pollution that collect data on a single topic, such as dealing with issues related to specific economic sectors, sources of pollution, groups of pollutants, or environmental media.

10. While traditional PRTRs collect, manage and disseminate to the public data on any significant emissions and wastes, PRTRs that provide context about the data collected increase their usefulness. The Protocol on Pollutant Release and Transfer Registers (Kyiv Protocol), for example, acknowledges the relevance of providing context and integration with other databases and sources of information; however, it does not provide details on how context and integration is to be achieved.

A. Pollution information portals and environmental governance

11. Environmental governance addresses questions of environmental policymaking, such as regulatory frameworks, institutional arrangements, stakeholder engagement, justice and equity, sustainability, science, risk assessment, and compliance and enforcement.[9] Thus, the procedural dimensions of the human right to a clean, healthy and sustainable environment directly concern environmental governance, particularly the rights of access to information, participation in decision-making, and access to justice in environmental matters. PIPs particularly concern the questions of: what is the underlying evidentiary basis of decision-making; and whether individuals and communities are informed about the risks and harms of pollution.[10]

[6] On 4 April 2024 for South, East and South-East Asia; on 8 April 2024 for Latin America and the Caribbean; and on 16 April 2024 for Africa, Central Asia, Europe and the Middle East; co-convened by the International Pollutants Elimination Network.

[7] Economic Commission for Latin America and the Caribbean, "Special session on access to information in environmental matters", 23 April 2024, available at https://acuerdodeescazu.cepal.org/cop3/en/programme/special-session-access-information-environmental-matters.

[8] Pollutants are internationally defined as "a substance or a group of substances that may be harmful to the environment or to human health on account of its properties and of its introduction into the environment" (Protocol on Pollutant Release and Transfer Registers (Kyiv Protocol), art. 2 (6)).

[9] See, for example, Paul Cairney, Irina Timonina and Hannes Stephan, "How can policy and policymaking foster climate justice? A qualitative systematic review", Open Research Europe, 10 October 2023.

[10] Submission by the secretariat of the Aarhus Convention and its Kyiv Protocol.

12. The right to information, also often referred to as the right to know, is fundamental to the environmental justice movement, to fostering local community empowerment, and to the indispensable work of environmental human rights defenders. The right of access to information extends not only to environmental impact assessments to prevent, control or reduce pollution, but also to actual emissions and wastes. Thus, PIPs help fulfil the public's right to know about environmental threats that are present within their community.[11] Access to this specific data enables individuals and communities to take precautions and reduce exposure. However, as noted in earlier reports of the Special Rapporteur, it is key that this information be available in a form that is easy to use, including by groups in vulnerable situations.[12]

13. The data compiled by PIPs can also contribute to realization of the right to science by enabling evidence-based decision-making. The alignment between policy and regulatory frameworks and the best available scientific evidence is one of the key elements of the right to science in the context of hazardous substances, and PIPs stand precisely at the science–policy interface.[13] They offer invaluable resources for scientists, regulators, individuals and organizations conducting research on pollution trends, industrial and business practices, and the effectiveness of environmental policies.[14]

14. PIP data also enable regulatory authorities and the public to assess potential risks to human health and the environment from emissions and wastes, thus allowing for targeted interventions and regulatory actions to prevent exposure.[15] By analysing the data, authorities can develop and strengthen regulations that limit the release of hazardous substances, set or improve environmental standards, and establish guidelines for safe industrial and business practices.[16]

15. PIPs also create a powerful record of emissions and wastes.[17] This enables an evaluation of the effectiveness of environmental protection measures, including instances of regression in environmental standards and/or quality.[18]

16. By promoting transparent access to information on emissions and wastes, PIPs play a role in raising public awareness and educating local communities on the environmental impact of industrial and business activities, thus enabling the public to meaningfully participate in decision-making. This participatory approach can also lead to effective remediation strategies.[19]

17. Access to data and actionable knowledge allows the public to understand the extent of environmental harm, identify potentially responsible parties, and seek appropriate

[11] Peter H. Sand, "The right to know: freedom of environmental information in comparative and international law", *Tulane Journal of International and Comparative Law*, vol. 20, No. 1 (2011), pp. 2 and 3.

[12] A/HRC/30/40, paras. 28–31.

[13] See A/HRC/48/61.

[14] Organisation for Economic Co-operation and Development (OECD), Guidance Document on Elements of a PRTR: Part I, document ENV/JM/MONO(2014)33, p. 12, available at https://one.oecd.org/document/env/jm/mono(2014)33/en/pdf.

[15] United States of America, Environmental Protection Agency, "Human health risk assessment", 6 December 2023, available at https://www.epa.gov/risk/human-health-risk-assessment.

[16] Economic Commission for Europe, "About PRTR", available at https://prtr.unece.org/about-PRTR.

[17] OECD, Global Pollutant Release and Transfer Register, Proposal for a Harmonised List of Pollutants, document ENV/JM/MONO(2014)32, pp. 9 and 10, available at https://one.oecd.org/document/env/jm/mono(2014)32/en/pdf.

[18] See, for example, European Environmental Bureau, ClientEarth, Carbon Market Watch and Environmental Coalition on Standards, "NGO preliminary assessment of the European Commission's proposal for revised Industrial Emissions Directive (IED) and Regulation on reporting of environmental data from industrial installations and establishing an Industrial Emissions Portal (E-PRTR)", 5 April 2022, available at https://eeb.org/wp-content/uploads/2022/04/IED-and-PRTR-revision_NGO-Preliminary-assessment.pdf.

[19] See, for example, University of Kansas, "Section 2: participatory approaches to planning community interventions", Community Tool Box, available at https://ctb.ku.edu/en/table-of-contents/analyze/where-to-start/participatory-approaches/checklist.

remedies.[20] This knowledge, coupled with the appropriate scientific and technical expertise, can prompt local communities to meaningfully participate in the defence of their human right to a clean, healthy and sustainable environment, and seek redress.[21]

18. Engaging members of the public in decision-making ensures that local community perspectives are considered.[22] Armed with PIP data, communities can engage in informed legal, regulatory and policy advocacy[23] by highlighting environmental concerns, petitioning for statutory and regulatory changes, and mobilizing support for remediation.[24]

19. PIPs can also help legislators and regulators identify trends and patterns of environmental harm. This information enables them to respond to emerging issues, and also to strengthen laws and regulations and enforce compliance measures, which can themselves become mechanisms for remedy and prevention.[25]

20. The data from PIPs can contribute to the enforcement of pollution standards by providing evidence.[26] In the event of environmental harm or a violation of environmental standards, affected members of the public can use PIP data as a basis for legal action,[27] which aids enforcement.[28]

21. PIPs can also help States implement their commitments under multilateral environmental agreements and channel their efforts at international cooperation. The Minamata Convention on Mercury is illustrative of this role. In regard to public information, awareness and education, it provides that "each Party shall use existing mechanisms or give consideration to the development of mechanisms, such as pollutant release and transfer registers where applicable, for the collection and dissemination of information on estimates of its annual quantities of mercury and mercury compounds that are emitted, released or disposed of through human activities".[29]

22. PIPs are relevant to all United Nations Member States, as they take steps to implement the human right to a clean, healthy and sustainable environment. Their benefits can support both developing and industrialized States. In this regard, PIPs are instrumental in achieving the Sustainable Development Goals, in particular Goal 3 (on good health and well-being), Goal 9 (on industry, innovation and infrastructure) and Goal 12 (on responsible production and consumption).

B. Pollution information portals and corporate responsibilities

23. Where reporting is required by law, businesses provide information to PIPs on their emissions and wastes. Adequate enforcement secures equal treatment of different reporting

[20] United States, Environmental Protection Agency, "Finding potentially responsible parties (PRP)", 1 May 2024, available at https://www.epa.gov/enforcement/finding-potentially-responsible-parties-prp.

[21] Submissions by Canada and Child Rights International Network.

[22] United States, Environmental Protection Agency, "Public participation guide: introduction to public participation", 9 February 2024, available at https://www.epa.gov/international-cooperation/public-participation-guide-introduction-public-participation.

[23] University of Kansas, "Section 2: participatory approaches to planning community interventions".

[24] National Advisory Council for Environmental Policy and Technology, *Environmental Protection Belongs to the Public: A Vision for Citizen Science at EPA* (2016).

[25] David Boyd and Stephanie Keenan, "Essential elements of effective and equitable human rights and environmental due diligence legislation", Policy Brief No. 3 (OHCHR, 2022), available at https://www.ohchr.org/sites/default/files/documents/issues/environment/srenvironment/activities/2022-07-01/20220701-sr-environment-policybriefing3.pdf.

[26] European Commission, "The European Pollutant Release and Transfer Register (E-PRTR)", available at https://environment.ec.europa.eu/topics/industrial-emissions-and-safety/european-pollutant-release-and-transfer-register-e-prtr_en.

[27] Joint submission by Health and Environment Justice Support, Swedish Society for Nature Conservation and groundWork South Africa.

[28] Anna Berti Suman, "Citizen sensing from a legal standpoint: legitimizing the practice under the Aarhus framework", *Journal for European Environmental & Planning Law*, vol. 18, No. 1-2 (February 2021).

[29] Art. 18 (2).

facilities.[30] Some States even regard false or inaccurate reporting as a form of environmental crime. In States that have not established PIPs, however, reporting is voluntary for businesses. Some businesses with a transnational presence only report in those jurisdictions that have mandatory PIPs but refuse to disclose similar data in other jurisdictions.[31]

24. Several instruments concerning business conduct and human rights highlight the importance of environmental information disclosure. The Organisation for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises on Responsible Business Conduct, for example, call on businesses to proactively disclose information on the environmental and social risks and impacts of their activities, to respect human rights and refrain from any action that may adversely impact on them, and to improve their environmental performance, including by applying the prevention, precautionary and "polluter pays" principles, especially when there is a risk of irreversible damage.[32] Accurate and timely reporting to PIPs can help in discharging these responsibilities and may be seen as an element of human rights due diligence by businesses, as articulated in the Guiding Principles on Business and Human Rights.[33]

25. The emergence of environmental, social, and governance frameworks demands businesses' respect for consumers and communities, and accountable leadership.[34] These standards entail corporate good practices, such as information disclosure and reporting to PIPs. Business leadership can be tied to this practice, since capturing efficiencies and driving technological innovation is directly related to measuring and reporting on environmental performance, including in respect of emissions and wastes. Environmental, social, and governance frameworks can also help identify businesses that seek to benefit from anti-competitive practices, such as non-compliance with environmental standards.[35]

III. State of play on pollution information portals

26. A diverse array of international, regional and national instruments have set up PIPs. One of the first was established by the United States of America in 1986, partly in response to the chemical disaster caused by a United States corporation in Bhopal, India, in December 1984. Since, Agenda 21, the blueprint for action concluded at the United Nations Conference on Environment and Development (Earth Summit) in 1992, has exerted strong influence in efforts by States to establish such PIPs. Also, implementation agreements on access rights to information, participation and justice in environmental matters include commitments on PIPs. Furthermore, a dedicated international treaty on the matter was adopted in 2003. Still, there are numerous States that do not have PIPs, or where reporting is only voluntary.[36] Thus, the call in the Global Framework on Chemicals – For a Planet Free of Harm from Chemicals and Wastes, adopted by the International Conference on Chemicals Management at its fifth session, in 2023, for States to establish PRTRs, is particularly timely.[37]

A. International and regional instruments on pollution information portals

27. Legally binding agreements and voluntary guidelines on PIPs have strongly influenced national practices. Certain instruments are devoted specifically to PIPs, while

[30] Ma Jun and others, *Establishing a PRTR Disclosure System in China* (Institute of Public & Environmental Affairs and International Pollutants Elimination Network, 2018), pp. 6 and 7, available at http://wwwoa.ipe.org.cn//Upload/201805091156300411.pdf.

[31] Submission by the Research Centre for Gender, Family and Environment in Development.

[32] See chaps. IV and VI.

[33] Principles 18–21.

[34] Investopedia, "What is ESG investing?", 21 March 2024, available at https://www.investopedia.com/terms/e/environmental-social-and-governance-esg-criteria.asp.

[35] OECD, Environmental Considerations in Competition Enforcement, document DAF/COMP(2021)4, available at https://one.oecd.org/document/DAF/COMP(2021)4/en/pdf.

[36] New Zealand, Ministry for the Environment. "Measuring emissions: a guide for organisations – 2022 quick guide" (2022).

[37] Target B3.

others focus on them in regard to the environmental pressures resulting from increasing economic activity and international trade.

1. Agenda 21

28. Agenda 21, the comprehensive plan of action adopted at the Earth Summit in 1992, urged Governments to establish databases on chemicals, including emission inventories, with collaboration from industry and the public.[38] Agenda 21 built upon earlier initiatives such as the 1972 Declaration of the United Nations Conference on the Human Environment, which called for the establishment of an International Registry of Data on Chemicals in the Environment[39] and the International Register of Potentially Toxic Chemicals, established by the United Nations Environment Programme (UNEP) in 1975.

29. The emphasis towards enhanced transparency and information-sharing was further reinforced by the Johannesburg Plan of Implementation, adopted at the World Summit on Sustainable Development in 2002, in which States specifically committed themselves to changing unsustainable patterns of consumption and production through, inter alia, the development of PRTRs.[40]

2. Aarhus Convention

30. Negotiated under the auspices of the Economic Commission for Europe and adopted in 1998, the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention) was the first legally binding international instrument on environmental democracy that put principle 10 of the Rio Declaration on Environment and Development into practice.[41] The Aarhus Convention requires each party to "take steps to establish progressively, taking into account international processes where appropriate, a coherent, nationwide system of pollution inventories or registers on a structured, computerized and publicly accessible database compiled through standardized reporting".[42] The Convention adds that such a system may include "inputs, releases and transfers of a specified range of substances and products, including water, energy and resource use, from a specified range of activities to environmental media and to on-site and offsite treatment and disposal sites".[43] Pursuant to its provisions, work on PRTRs began at the first meeting of signatories in 1999, and led to the adoption of the Kyiv Protocol on PRTRs.[44]

3. Kyiv Protocol on Pollutant Release and Transfer Registers

31. Adopted in 2003, the Kyiv Protocol is the only legally binding international instrument entirely dedicated to PRTRs. The treaty aims to contribute to pollution prevention and reduction. It identifies the core elements, design and structure of PRTRs; lists the specific activities, pollutants and thresholds that are subject to reporting requirements by facility owners and operators; establishes their reporting cycle; sets forth their record-keeping, quality assessment, public access to information and confidentiality obligations; and sets standards for public participation, access to justice, capacity-building and international cooperation.[45] The Kyiv Protocol sets minimum standards on each of these matters, which thus allows parties to include additional elements, as they may deem appropriate.[46]

[38] Paras. 19.55–19.65.
[39] Recommendation 74 (e).
[40] A/CONF.199/20, para. 23 (f).
[41] See https://unece.org/environment-policy/public-participation/aarhus-convention/introduction.
[42] Art. 5 (9). Art. 19 (3) allows accession by any United Nations Member State, upon approval by the Meeting of the Parties.
[43] Art. 5 (9).
[44] Economic Commission for Europe, *Guidance on Implementation of the Protocol on Pollutant Release and Transfer Registers to the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters* (New York and Geneva, 2008), pp. 2 and 3.
[45] Kyiv Protocol, arts. 1 and 4–16 and annexes I, II and III.
[46] Ibid., art. 3 (2).

32. The Kyiv Protocol requires each party to establish PRTRs that are publicly accessible online at no charge and with limited data confidentiality. PRTRs must be searchable by facility, pollutant, location and medium. Facilities must report releases and transfers of the 86 pollutants regulated by the Kyiv Protocol, which covers major greenhouse gases, acid rain pollutants, ozone-depleting substances, heavy metals, pesticides, polychlorinated biphenyls, volatile organic compounds, and dioxins. Releases from diffuse sources must also be reported if data is available. Otherwise, measures need to be taken to initiate reporting on releases from one or more diffuse sources, in accordance with national priorities.[47] Unlike other multilateral environmental agreements, the Kyiv Protocol does not focus on a specific medium, substance or group of substances, or source. Rather, PRTRs are comprehensive registers about any emissions or wastes.[48]

33. The Economic Commission for Europe issued its Guidance to the Protocol in 2008. The Guidance clarifies requirements for data reporting, including the format, frequency and content of reports. It recommends using standardized formats to facilitate data collection and analysis, and using internationally recognized codes and classifications for pollutants and industries.[49] The Guidance to the Protocol also recommends validation and verification procedures by competent authorities, as well as capacity-building for industries and businesses that report, in order to improve data quality. It encourages the use of PRTR data for analysing and reporting on geographic areas of concern, pollution trends, and areas for improvement. Moreover, it recommends integrating PRTRs with broader environmental management systems, and proactively promoting public access to information and participation to enhance decision-making.[50] A number of other guidance materials on implementation, annex revision, and plastics, among other matters, have recently been developed under the Kyiv Protocol.[51]

4. Escazú Agreement

34. Negotiated under the auspices of the Economic Commission for Latin America and the Caribbean and adopted in 2018, the Escazú Agreement requires each party to "take steps to establish a pollutant release and transfer register covering air, water, soil and subsoil pollutants, as well as materials and waste in its jurisdiction. This register will be established progressively and updated periodically."[52] The third meeting of the Conference of the Parties held a special session in 2024 that focused on this provision. The special session discussed slow progress to date in its implementation, however it also identified certain good practices and opportunities for action, including possible roles for the Committee to Support Implementation and Compliance.

5. Organisation for Economic Co-operation and Development

35. OECD has carried out pioneering work on PRTRs. In 1996, the OECD Council adopted a recommendation on implementing PRTRs, which was subsequently amended in 2003 and then replaced in 2018.[53] The current version identifies various elements for effective

[47] Economic Commission for Europe, "PRTRs advancing sustainability, environmental governance and a green economy", available at https://unece.org/DAM/env/pp/prtr/docs/2012/PRTR_brochure_-_13_june_-_EN_colour.pdf.

[48] Kyiv Protocol, art. 7 (4), (7) and (8).

[49] Economic Commission for Europe, *Guidance on Implementation of the Protocol on Pollutant Release and Transfer Registers*, pp. 20, 30 and 59–67.

[50] Ibid., pp. 10–*15*, 19, 47, 67 and 84–89.

[51] ECE/MP.PRTR/WG.1/2018/6, ECE/MP.PRTR/WG.1/2019/6, ECE/MP.PRTR/WG.1/2019/6/Add.1, ECE/MP.PRTR/WG.1/2020/4 and ECE/MP.PRTR/WG.1/2022/6.

[52] Art. 6 (4). Art. 21 (2) allows accession by any Latin American or Caribbean State.

[53] OECD, "Introduction to Pollutant Release and Transfer Registers (PRTRs)", 3 May 2018, available at https://web-archive.oecd.org/2018-05-03/60840-introductionto-pollutant-release-and-transfer-registers.htm.

design, implementation, evaluation and revision.[54] OECD has also produced technical reports that analyse PRTR characteristics, and differences, and their alignment with national goals.

36. OECD has further published a Guidance Document, which signals good practices to assist countries in establishing and maintaining effective PRTR systems.[55] It emphasizes the importance of ensuring public access to PRTR information, including recommendations on making data easily accessible through online platforms[56] and on engaging stakeholders in PRTR-related decision-making.[57]

37. The Guidance Document also provides recommendations on the scope and coverage of PRTR systems. It favours a comprehensive approach to ensure that PRTRs cover a broad range of pollutants and activities. It recommends methods and standards for data reporting and collection, including guidance on the types of information to be reported, measurement methodologies, reporting frequency, quality assurance mechanisms, data verification processes, and the role of regulatory authorities in overseeing data accuracy.[58]

38. Recognizing the transboundary potential of pollution, the Guidance Document encourages international cooperation and harmonization of these systems. This involves aligning reporting standards and data exchange mechanisms, as well as integrating these registers with broader environmental management systems for risk assessments, policy development and regulatory decision-making. The Guidance Document also provides recommendations on conducting periodic assessments of the effectiveness of PIPs and making necessary adjustments.[59]

6. European E-PRTR

39. The European Commission adopted the European pollutant emission register in 2000.[60] This instrument was based on the European Union Integrated Pollution Prevention and Control Directive, which contained an annex I with activities such as the energy, metal, mineral and chemical industries, livestock farming and waste management. However, this register did not include provisions for off-site transfers of waste, releases to land, or diffuse pollution estimates.[61]

40. Once the European Union had deposited its instrument of ratification of the Kyiv Protocol in 2006, it left the European pollutant emission register aside and adopted the E-PRTR, which integrates data provided by European Union members, whether or not they have their own national PIPs. This register currently includes data for 91 key pollutants, including heavy metals, pesticides, greenhouse gases and dioxins, emitted or transferred from 35,000 industrial facilities.[62] The European Union has applied efforts to align the E-PRTR with the Industrial Emissions Directive, revised in 2024.[63]

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[54] OECD, Recommendation of the Council on Establishing and Implementing Pollutant Release and Transfer Registers, 10 April 2018, available at https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0440.

[55] OECD, “Monitoring and preventing industrial pollution”, available at https://www.oecd.org/en/topics/monitoring-and-preventing-industrial-pollution.html.

[56] OECD, Guidance Document on Elements of a PRTR: Part I, pp. 42–44.

[57] OECD, Guidance Document on Elements of a PRTR: Part II, document ENV/JM/MONO(2015)45, pp. 36–41 and 44–46, available at https://one.oecd.org/document/env/jm/mono(2015)45/en/pdf.

[58] OECD, Guidance Document on Elements of a PRTR: Part I, pp. 16–34; and Guidance Document on Elements of a PRTR: Part II, pp. 30–36, 47 and 48.

[59] OECD, Guidance Document on Elements of a PRTR: Part I, pp. 45–48; and Guidance Document on Elements of a PRTR: Part II, pp. 16–27, 47, 48 and 67–77.

[60] European Environment Agency, “European pollutant emission register”, available at https://www.eea.europa.eu/help/glossary/eea-glossary/european-pollutant-emission-register.

[61] Economic Commission for Europe, *Guidance on Implementation of the Protocol on Pollutant Release and Transfer Registers*, p. 4.

[62] European Commission, “The European Pollutant Release and Transfer Register (E-PRTR)”, available at https://environment.ec.europa.eu/topics/industrial-emissions-and-safety/european-pollutant-release-and-transfer-register-e-prtr_en.

[63] Submission by the European Commission.

7. Agreement on Environmental Cooperation among the Governments of the United States of America, the United Mexican States and Canada

41. The Commission for Environmental Cooperation was first established by the North American Agreement on Environmental Cooperation, a side-treaty to the North American Free Trade Agreement between Canada, Mexico and the United States; both of which entered into force in 1994.[64] In 2020, the Agreement on Environmental Cooperation entered into force, superseding the previous North American Agreement on Environmental Cooperation and allowing the Commission to continue to operate.[65]

42. The Commission for Environmental Cooperation has published its *Taking Stock* report series, with 16 reports compiling on-site and off-site pollutant release and transfer data since 1998.[66] These reports are based on the information reported by facilities to the National Pollutant Release Inventory, of Canada; the PRTR of Mexico; and the Toxics Release Inventory, of the United States;[67] and aim to promote public access, to improve understanding and to support decision-making by analysing and disseminating PRTR data.[68] The regional scope of these data is particularly useful for tracking cross-border transfers, thus enabling regional cooperation.

B. Multilateral environmental agreements on specific media, substances or groups of substances, or sources of pollution

43. Several multilateral environmental agreements prescribe reporting requirements for parties in respect of controlled pollutants of global importance and administer PIPs where this information is publicly available. Information databases of such agreements are often not integrated with national PIPs.

1. International Convention for the Prevention of Pollution from Ships

44. This Convention aims to prevent pollution by oil, harmful substances carried by sea in packaged form, and sewage, garbage and air pollution from ships; and to control pollution by noxious liquid substances in bulk.[69] Incidents involving excess discharges, including harmful substances in containers, tanks, vehicles and barges, must be reported to the local maritime safety authority by the ship master, owner, charterer or manager, or operator of the vessel, or their agent, using the standard International Maritime Organization format.[70] The Convention secretariat makes this information publicly available to registered users by including compilations or summaries in circulars that are published on the IMODOCS database.[71]

2. London Convention and its Protocol

45. The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention) entered into force in 1975. It prohibits the dumping at

[64] Economic Commission for Europe, “Aarhus Clearinghouse for Environmental Democracy: North American Agreement on Environmental Cooperation – Canadian Office”, 10 February 2016, available at https://aarhusclearinghouse.unece.org/resources/north-american-agreement-environmental-cooperation-canadian-office.

[65] See art 2.1 of the Agreement on Environmental Cooperation, available at http://www.cec.org/about/agreement-on-environmental-cooperation/.

[66] See http://www.cec.org/publications/?_series=taking-stock-series.

[67] Submission by the Commission for Environmental Cooperation’s Environmental Quality Unit.

[68] Commission for Environmental Cooperation, “Tracking pollutant releases and transfers in North America”, available at http://www.cec.org/tracking-pollutant-releases-and-transfers-in-north-america-1/.

[69] International Maritime Organization (IMO), “Pollution prevention”, available at https://www.imo.org/en/ourwork/environment/pages/pollution-prevention.aspx.

[70] Australian Marine Safety Authority, “Mandatory MARPOL pollution reporting”, 29 June 2023, available at https://www.amsa.gov.au/marine-environment/marine-pollution/mandatory-marpol-pollution-reporting.

[71] IMO Circulars, available at https://www.imo.org/en/OurWork/Circulars/Pages/default.aspx.

sea of certain hazardous materials, such as organohalogens, mercury and cadmium compounds, persistent plastics, crude oil and its wastes, refined petroleum products, residues and mixtures, and biological and chemical weapons.[72] Amendments entering into force in 1996 banned the dumping of low-level radioactive and industrial wastes, as well as the incineration at sea of the latter.[73]

46. The 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Protocol), which is a supplementary treaty to the London Convention, entered into force in 2006, and establishes a "reverse list", meaning that dumping of all unlisted wastes and materials is prohibited. Parties are required to report dumping permits and monitoring activities annually to the International Maritime Organization.[74] The Convention secretariat makes this information publicly available to registered users by including compilations or summaries in circulars that are published on the IMODOCS database.[75] Parties are also to develop a national Action List, that includes toxic, persistent and bioaccumulative substances of anthropogenic origin, to be screened before considering them for dumping.[76]

3. Basel, Rotterdam and Stockholm Conventions

47. The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, which entered into force in 1992,[77] regulates the transboundary movement of hazardous wastes and their disposal. The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, which entered into force in 2004,[78] regulates prior informed consent for the import and export of certain hazardous chemicals and pesticides. The Stockholm Convention on Persistent Organic Pollutants, which entered into force in 2004, regulates the production, use, trade and release of persistent organic pollutants.[79]

48. Under the Basel Convention, parties submit mandatory annual reports to the secretariat,[80] which detail exports, imports, the generation of, disposals of, and accidents involving, hazardous wastes and other wastes falling under a controlled category or requiring special consideration.[81] Under the Rotterdam Convention, parties submit notifications of final regulatory action, proposals for the listing of severely hazardous pesticide formulations, export notifications, responses on imports of and information on transits of these substances, inter alia, which the secretariat publishes biannually in the PIC Circular.[82] Under the Stockholm Convention, parties submit mandatory quadrennial reports on the measures taken

[72] IMO, "Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter", available at https://www.imo.org/en/OurWork/Environment/Pages/London-Convention-Protocol.aspx.

[73] IMO, "Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter", available at https://www.imo.org/en/About/Conventions/Pages/Convention-on-the-Prevention-of-Marine-Pollution-by-Dumping-of-Wastes-and-Other-Matter.aspx.

[74] Environmental Protection Agency, "Ocean dumping: international treaties", 7 April 2024, available at https://www.epa.gov/ocean-dumping/ocean-dumping-international-treaties.

[75] IMO Circulars, available at https://www.imo.org/en/OurWork/Circulars/Pages/default.aspx.

[76] London Protocol, annex 2, sect. 9.

[77] Secretariat of the Basel Convention, "History of the negotiations of the Basel Convention", available at https://www.basel.int/TheConvention/Overview/History/Overview/tabid/3405/Default.aspx.

[78] Secretariat of the Rotterdam Convention, "History of the negotiations of the Rotterdam Convention", available at https://www.pic.int/TheConvention/Overview/History/Overview/tabid/1360/language/en-US/Default.aspx.

[79] Secretariat of the Stockholm Convention, "Updates on listing and reporting of hazardous chemicals and wastes under the BRS Conventions", 27 November 2022, available at https://unece.org/sites/default/files/2023-12/PRTR-WGP10_3_BRS_Conventions.pdf.

[80] Secretariat of the Basel Convention, "National reporting", available at https://www.basel.int/Procedures/NationalReporting/tabid/1332/Default.aspx.

[81] Secretariat of the Basel Convention, "Manual: questionnaire on 'transmission of information'", available at https://www.basel.int/Portals/4/Basel%20Convention/docs/natreporting/manual/manual-e.pdf.

[82] Secretariat of the Rotterdam Convention, "PIC Circular", available at https://www.pic.int/PICCircular/tabid/1168.

in its implementation, including the progress towards the elimination of polychlorinated biphenyls.[83] Reports and notifications submitted under the Conventions are publicly available. Data is subject to quality control by each Convention's secretariat, which sends queries asking for clarification when necessary.[84]

4. Minamata Convention on Mercury

49. This Convention addresses the adverse effects of mercury on human health and the environment[85] and entered into force in 2017.[86] It requires each party to submit full-format reports quadrennially and partial reports biennially on the measures it has taken to implement the Convention, as well as on their effectiveness and on challenges.[87] The Convention requires that the secretariat make information on mercury-added products and mercury compounds publicly available. The Convention also contemplates a possible role for PRTRs for the collection and dissemination of annual estimates of mercury that are emitted, released or disposed of.[88]

5. Montreal Protocol

50. This Protocol is a supplementary treaty to the Vienna Convention for the Protection of the Ozone Layer,[89] and entered into force in 1989.[90] Each party must submit statistical data on ozone-depleting substances annually. These statistical data are used by the Ozone Secretariat to calculate each party's consumption and production of these substances.[91] The secretariat makes these calculations publicly available[92] and includes them in a Technology Information Clearinghouse.[93]

6. United Nations Framework Convention on Climate Change

51. This Convention entered into force in 1994.[94] It deals with greenhouse gas emissions and requires parties to the Convention and to its supplementary treaty, the Kyoto Protocol, to comply with its comprehensive measurement, reporting and verification framework. The reporting obligations for annex I parties include annual national greenhouse gas inventories[95] from five sectors: energy; industrial processes and product use; agriculture; land use, land-use

[83] Secretariat of the Stockholm Convention, "Overview and mandate", available at https://chm.pops.int/Countries/Reporting/OverviewandMandate.

[84] Secretariat of the Basel Convention, "Reporting Dashboard", available at https://www.basel.int/Countries/NationalReporting/ReportingDashboard/tabid/8105/Default.aspx; secretariat of the Rotterdam Convention, "Database of Import Responses", available at https://www.pic.int/Procedures/ImportResponses/Database/tabid/1370/language/en-US/Default.aspx; and secretariat of the Stockholm Convention, "Reporting Dashboard", available at https://chm.pops.int/Countries/Reporting/ReportingDashboard/tabid/7477/Default.aspx.

[85] UNEP and Minamata Convention on Mercury, "About us", available at https://minamataconvention.org/en/about.

[86] UNEP and Minamata Convention on Mercury, "History of the negotiations process", available at https://minamataconvention.org/en/about/history.

[87] UNEP and Minamata Convention on Mercury, "National reporting pursuant to article 21", available at https://minamataconvention.org/en/parties/reporting.

[88] Arts. 4 (4) and (6), 5 (4) and 18 (2).

[89] UNEP and Ozone Secretariat, "The Vienna Convention for the Protection of the Ozone Layer", available at https://ozone.unep.org/treaties/vienna-convention.

[90] UNEP and Ozone Secretariat, "The Montreal Protocol on Substances that Deplete the Ozone Layer", available at https://ozone.unep.org/treaties/montreal-protocol.

[91] UNEP and OzonAction, "Data reporting and surveys", available at https://www.unep.org/ozonaction/what-we-do/data-reporting-and-surveys.

[92] UNEP and Ozone Secretariat, "Country data", available at https://ozone.unep.org/countries/data.

[93] UNEP, "Experiences and challenges: Technology Information Clearinghouse under the Montreal Protocol", available at https://unfccc.int/sites/default/files/shende.pdf.

[94] United Nations Framework Convention on Climate Change secretariat, "Status of ratification of the Convention", available at https://unfccc.int/process-and-meetings/the-convention/status-of-ratification-of-the-convention.

[95] United Nations Framework Convention on Climate Change secretariat, "Reporting and review", available at https://unfccc.int/reporting-and-review#MRV.

change and forestry; and waste.[96] The reporting obligations for annex II parties include biennial update reports on their national greenhouse gas Inventories. Both are publicly available.[97]

C. National-level practices with pollution information portals

52. Certain national PIP systems, such as the ones from the Kingdom of the Netherlands and the United States of America, predate international and regional instruments. Others reflect distinct elements worth highlighting, such as going beyond minimum standards, and enabling integration with other environmental information platforms, like the ones from Chile and Czechia.

1. Kingdom of the Netherlands

53. The first efforts to establish a PRTR in the Kingdom of the Netherlands date back to 1974. It currently includes more than 350 pollutants by individual point sources (companies or facilities) from sectors and subsectors relevant to environmental policies, such as agriculture, the chemical industry, construction, consumers, energy production, nature, other industries, refineries, sewage and wastewater treatment, trade and services, transport and waste disposal; as well as diffuse emissions, calculated from national statistics by task forces, reporting every year.[98] Both the Government Information (Public Access) Act and the Environmental Management Act provide for this information to be publicly available.[99]

2. United States

54. The United States Toxic Release Inventory[100] is considered one of the world's first PRTRs.[101] The Toxic Release Inventory was established by the Emergency Planning and Community Right-to-Know Act of 1986, which provides for access to information on chemicals used at and released from individual facilities. This Act was passed by the United States Congress in large part in response to the industrial disaster in Bhopal, India, in 1984. More than half a million people were exposed to toxic methyl isocyanate gas that had escaped from a Union Carbide chemical facility.[102] As many as 10,000 people died within three days of the leak, and it is estimated that more than 22,000 have died as a direct result of exposure.[103]

55. The Toxic Release Inventory currently includes 770 chemicals and 33 chemical categories that cause cancer or other chronic human health effects, and significant adverse acute human health or environmental effects, produced by sectors such as manufacturing, metal mining, electric power generation, chemical manufacturing and hazardous waste treatment. Facilities that manufacture, process or otherwise use these chemicals above established levels must submit reporting forms for each chemical every year.[104]

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[96] United Nations Framework Convention on Climate Change secretariat, "Reporting requirements", available at https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/greenhouse-gas-inventories-annex-i-parties/reporting-requirements?gad_source=1&gclid=CjwKCAiA3JCvBhA8EiwA4kujZlwaW-cZHTlgANCVdm-kisdTQMiSLNZgII3EfhlUpOl9MoocCrEXmxoCAqMQAvD_BwE.

[97] See https://unfccc.int/reporting-and-review#MRV.

[98] Kingdom of the Netherlands, Pollutant Release and Transfer Register, "General introduction to the Emission Register project", available at https://legacy.emissieregistratie.nl/erpubliek/content/explanation.en.aspx.

[99] See https://e-justice.europa.eu/300/EN/access_to_justice_in_environmental_matters?NETHERLANDS&action=maximizeMS&clang=en&idSubpage=1&member=1 (sect. 1.7.4, subsect. 1).

[100] Environmental Protection Agency, "Toxics Release Inventory (TRI) Program", available at https://www.epa.gov/toxics-release-inventory-tri-program.

[101] Environmental Protection Agency, "TRI around the world", available at https://www.epa.gov/toxics-release-inventory-tri-program/tri-around-world.

[102] A/HRC/49/53, para. 10.

[103] Amnesty International, *Bhopal: 40 Years of Injustice* (2024).

[104] Environmental Protection Agency, "What is the Toxics Release Inventory?", available at https://www.epa.gov/toxics-release-inventory-tri-program/what-toxics-release-inventory.

56. A key difference between the Toxic Release Inventory and other national initiatives is that it does not cover hazardous waste, which is regulated under the Resource Conservation and Recovery Act of 1976[105] and has its own PIP.[106]

3. Chile

57. The PRTR of Chile was created by the general law on the environment – Law No. 19.300 of 1994[107] – and is regulated by Decree No. 1/2013.[108] It currently includes 121 air, water and soil pollutants, and nine physical and biological parameters,[109] reported by point sources of pollution, such as thermal power stations, hazardous and non-hazardous waste generators, discharges to superficial (marine and continental) waters, and underground water and sewage systems; and by diffuse sources, such as transportation, agricultural burnings, forest and urban fires, and firewood consumption.[110]

58. This PRTR is currently being integrated with the National Environmental Information System,[111] also created by Law No. 19.300, which provides for this information to be publicly available.[112] Its electronic portal is a one-stop shop for more than 40,000 facilities subject to reporting obligations, regardless of the competent authority, while data on diffuse sources is reported by the competent authorities themselves.[113] This integration allows for continuous data improvement, developing information governance and implementing focalized analyses.[114]

4. Czechia

59. The Czech PRTR was created by Act No. 25/2008 Coll. and conforms to Government Regulation 145/2008 Coll., which established the list of pollutants, thresholds and required reporting data. Under the European Union's Industrial Emissions Directive, only 12.7 per cent of the 4,933 facilities reporting to this national register were actually required to report to the E- PRTR in 2016. Therefore, it has already exceeded European requirements by far,[115] by using a pollutant-specific approach that tracks the most hazardous substances.[116] In fact, the number of reported substances expanded from 72 in 2004 to 93 in 2008 and then to 97 in 2021,[117] while the European Union currently requires 91.

IV. Distillation and analysis of key elements of robust PIPs

60. There are various types of PIPs. Some have a distinct geographic coverage, such as supranational, regional and national PRTRs. Some others monitor general environmental quality at the local and national level, or specific emissions and wastes regulated by global

[105] Environmental Protection Agency, "History of the Resource Conservation and Recovery Act (RCRA)", available at https://www.epa.gov/rcra/history-resource-conservation-and-recovery-act-rcra.
[106] Environmental Protection Agency, "RCRAInfo", https://rcrainfo.epa.gov/rcrainfoprod/action/secured/login.
[107] Chile, Ministry of the Environment, "RETC: Normativa", available at https://retc.mma.gob.cl/normativa/ (in Spanish); and see https://observatoriop10.cepal.org/en/node/76.
[108] See https://www.bcn.cl/leychile/navegar?idNorma=1050536 (in Spanish).
[109] Ministry of the Environment, "RETC: ¿Qué es el RETC?", available at https://retc.mma.gob.cl/que-es-el-retc/ (in Spanish).
[110] Ministry of the Environment, Informe Consolidado de Emisiones y Transferencias de Contaminantes 2005-2020 (2022), pp. 14 and 15 (in Spanish).
[111] Submission by Chile (in Spanish).
[112] Ministry of the Environment, "¿Qué es el SINIA?", available at https://sinia.mma.gob.cl/que-es-el-sinia/ (in Spanish).
[113] Decree No. 1/2013.
[114] Submission by Chile.
[115] Eliška Vejchodská, Lenka Slavíková and Vítězslav Malý, "Evaluating the regulatory burden: Pollutant Release and Transfer reporting costs", *Prague Economic Papers*, vol. 25, No. 6 (2016), p. 674.
[116] ECE/MP.PRTR/WG.1/2020/4, para. 106 (e).
[117] Jindřich Petrlík and others, *Pollutant Release and Transfer Register and Civil Society* (Arnika – Toxics and Waste Programme and Nexus3 Foundation, 2023), pp. 20 and 21.

treaties. There are also thematic and sector-specific PIPs sponsored by governments, business-reporting PIPs and citizen science PIPs, among others. But regardless of their scope, robust PIPs exhibit key elements of design and implementation that enable their users to advance pollution prevention policies for the realization of the right a clean, healthy and sustainable environment.[118] What follows is a distillation of these good practices.

A. Pollution prevention objective

61. Robust PIPs clearly lay out their purpose of preventing and/or reducing pollution.[119] Robust portals are not simply tools for disseminating information on pollutants and wastes. Absence of a clear articulation of policy objectives carries the risk that PIPs may normalize pollution, encouraging a misplaced sense of complacency. Absence of clear objectives also presents the risk that stakeholders may erroneously confuse means and ends. In this regard, establishing and maintaining PIPs is but one element of due diligence in confronting environmental risks.

62. In robust PIPs, the goals of continuous improvement of environmental performance and prevention and reduction of exposure are established by law. The articulation of these objectives is critical for the adequate implementation of the right to a clean, healthy and sustainable environment.

B. Point and diffuse sources

63. In the case of point sources or facilities, the data to be reported by regulated activities include information on the nature and quantity of pollutants and wastes.[120] In the case of diffuse sources, such as from the use of products in agriculture (e.g. fertilizers and pesticides) and transport (e.g. tyres and brakes), direct measurements could be onerous, depending on the size of the individual sources. Therefore, some PIPs handle data on the basis of estimates that are derived from approved methodologies. Other portals collect data from national reports elaborated under other international instruments, or from owners/operators of activities such as agriculture.[121]

C. Minimum standards

64. Robust PIPs may go beyond the minimum standards set in international instruments. Accordingly, States may collect information on additional activities and pollutants, accounting for specific national needs and issues of particular concern. Indeed, the significance of sources and sectors may differ between countries and communities. For example, seven European countries include facilities such as waste transfer stations, or pollutants such as magnesium oxide, asphalt or oil.[122]

D. Quality assurance and verification

65. Robust PIPs collect the best available information, based on internationally approved methodologies. These deal with technical matters, including monitoring data, emission factors, mass balance equations, indirect monitoring, calculations, and engineering judgments.[123] Portal regulations provide for transparent data treatment, indicator building, and calculation.[124]

[118] A/73/188, para. 45.
[119] Kyiv Protocol, art. 1.
[120] Ibid., arts. 4 and 5.
[121] ECE/MP.PRTR/WG.1/2020/4, para. 61. See also Aarhus Convention, art. 5 (9).
[122] ECE/MP.PRTR/WG.1/2020/4, para. 26.
[123] Kyiv Protocol, art. 9 (2).
[124] Submission by Chile.

66. Robust systems prescribe pollution measurement by owners/operators for point sources. By contrast, PIPs define methodologies for competent authorities to calculate and estimate emissions from diffuse sources. In both cases, quality assessment is a shared responsibility for both owners/operators and competent authorities,[125] which can be carried out by industry inspectors or an autonomous third-party authority.[126]

67. In European Union countries, for example, under the European Union's Industrial Emissions Directive, direct and continuous measurement is mandatory for facilities, while the Industrial Emission Portal Regulation requires robust data collection, verification and validation, as well as standardized reporting.[127] By enforcing these measures, States ensure data accuracy, reliability, and completeness.[128]

E. Public access

68. Robust PIPs are user-friendly, publicly available online databases,[129] which are immediately and continuously accessible through various types of platforms or websites.[130] They are searchable by types of facilities/activities, substances, pollutant releases/transfers, waste disposals/recoveries, owners/operators/companies, and geographical location. They include at least 10 years of data and are expandable. They also include links to relevant information on environmental protection, as well as to PIPs from other countries. Updates are annual, and reports are publicly available, facilitating ongoing transparency and public awareness.[131]

69. Robust PIPs also provide easy-to-understand summaries and visualizations to enhance public understanding of environmental impacts and trends, such as integrated multimedia reporting.[132] Similarly, robust PIPs include descriptions of the characteristics and hazards of the pollutants covered.[133]

70. In Kyrgyzstan, for example, non-governmental organizations (NGOs) have put together an "Environmental Violations Map", which is a free online tool that collects and displays real-time information about environmental incidents and violations. Plans are currently under way to expand it to other Central Asian countries.[134]

F. Integration

71. There are several dimensions to the integration of PIPs. Mandatory reporting avoids duplication when it is harmonized or integrated with international and national reporting obligations.[135] Moreover, combining data from various PIPs helps to close the gap in substance coverage,[136] but this is only viable when such data is comparable and interoperable.[137] This means that States need to harmonize their reporting methods prior to

[125] Kyiv Protocol, art. 10.
[126] Submission by Marie-Michèle Saint-Marc (in French).
[127] European Environmental Bureau, ClientEarth, Carbon Market Watch and Environmental Coalition on Standards, "NGO preliminary assessment", pp. 21–23.
[128] Submission by the European Commission.
[129] Kyiv Protocol, art. 4.
[130] Economic Commission for Europe, "Electronic information tools case studies: Task Force on Access to Information", available at https://unece.org/env/pp/eit-case-studies.
[131] Kyiv Protocol, art. 5.
[132] Commission for Environmental Cooperation, "Tracking pollutant releases and transfers in North America", available at http://www.cec.org/tracking-pollutant-releases-and-transfers-in-north-america-1/.
[133] Economic Commission for Europe, document PRTR/WG.1/2018/Inf.3, item A2; and ECE/MP.PRTR/2021/10, para. 61.
[134] Submission by Ecological Monitoring and Investigations.
[135] Kyiv Protocol, art. 3 (5).
[136] Submission by Szilárd Erhart (input 1).
[137] Submission by Canada.

collecting data.[138] Integration is necessary to avoid the scattering and duplication of pollution-related databases. To promote synergy also with experts working on other topics, an easy-to-agree to terminology needs to be offered. Successful PRTR integration with other databases will not be a larger PRTR but a combination of different systems that includes PRTR data and functions, together with other data.

72. Another dimension is the integration of PRTRs with broader digital environmental management systems. This integration allows their data to be used to inform decision-making, policy development, and monitoring.[139] This may be achieved, for example, by developing digital systems that facilitate data sharing, discovery and accessibility.[140] Such is the case of the *Taking Stock* report series in North America. Consolidating data from national portals supports pollution prevention and fosters increased sustainability by industrial and business activities in the region.[141]

G. Confidentiality

73. Robust PIPs have limited exceptions for confidential information.[142] Exceptions to the principle of maximum disclosure and public access include international relations, national defence, public security, commercial and industrial secrets to protect legitimate economic interests, intellectual property and personal data. Such exceptions must be interpreted restrictively.[143]

H. Stakeholder engagement

74. Robust PIPs engage stakeholders and rights holders, including industries and businesses, NGOs, academia, groups in situations of vulnerability, and the public, in the design, implementation and review of the information system. This fosters dialogue, collaboration and partnerships to improve data quality and to address concerns. Strengthening communication with existing and potential communities of users can help improve data quality and identify new uses and applications.[144] More robust PIPs result from States proactively informing and providing opportunities for key stakeholders to comment on proposed PIP plans, legislation and policy.[145] Where technical words and concepts are explained in non-technical language, [146] stakeholders increase their awareness and understanding.[147]

I. Capacity-building and training

75. Robust PIPs provide capacity-building, including technical assistance, workshops and resources, to stakeholders such as government officials, industry representatives and data users, to enhance their knowledge and skills.[148] In Albania, Montenegro and the Republic of

[138] Ministry of the Environment, "Pollutant Release and Transfer Register in Chile: how PRTRs could function as a single window for environmental reporting and compliance with international standards", November 2013, p. 4, available at https://unece.org/fileadmin/DAM/env/pp/PRTR%20Bureau/GRT2013-Item2-3-Chile_How_PRTRs_could_function_as_a_single_window_for_environmental_reporting.pdf. See also European Environmental Bureau, ClientEarth, Carbon Market Watch and Environmental Coalition on Standards, "NGO preliminary assessment", pp. 21–23.

[139] Commission for Environmental Cooperation, "Action plan to enhance the comparability of Pollutant Release and Transfer Registers (PRTRs) in North America" (Montreal, Canada, 2014), p. 4.

[140] Submission by the secretariat of the Aarhus Convention and its Kyiv Protocol.

[141] Submission by the Commission for Environmental Cooperation's Environmental Quality Unit.

[142] Kyiv Protocol, art. 4 (g).

[143] Ibid., art. 12 (1).

[144] Submission by Chile.

[145] Submission by Canada.

[146] Submission by Voices for Peace.

[147] Submission by the Commission for Environmental Cooperation's Environmental Quality Unit.

[148] Commission for Environmental Cooperation, "Action plan", p. 14.

Moldova (States parties to the Kyiv Protocol) and Bosnia and Herzegovina (a signatory country to the Kyiv Protocol), as well as in Kosovo,[149] Germany funded such a project, co-funded by four NGOs, and jointly implemented with a consultancy firm from Hungary. Project partners trained authorities, operators and civil society organizations, installed or updated the relevant software, and translated European Union guidance documents.[150]

76. Furthermore, robust PIPs pay special attention to the right to education of specific groups, including those in situations of vulnerability, such as Indigenous Peoples, peasants and people working in rural areas, small-scale fishers, persons with disabilities, children, and communities impacted by armed conflicts and military activities, placing more emphasis on local languages.

J. Continuous evaluation and improvement

77. States with robust PIP systems monitor and evaluate their effectiveness, for example on a triennial basis.[151] This allows them to identify areas for improvement, address challenges, and adapt to changing environmental priorities and technological advancements.[152] European Union countries, for example, evaluated their national and regional PRTRs, concluding that they could benefit from adding context and harmonizing with other reporting obligations.[153] Similarly, a survey on the experiences of the parties in implementing the Kyiv Protocol concluded that PRTRs had evolved significantly since their inception, and that common challenges must be addressed through increased international cooperation.[154]

V. Critical evaluation of existing pollution information portal models

78. PIPs forge a path towards the implementation of the human right to a clean, healthy and sustainable environment. Existing models, however, exhibit certain gaps and shortcomings that limit their full potential.

A. Limited or non-mandatory reporting by businesses

79. PIPs generally focus on major industrial sources, largely for practical reasons of data collection. For example, regulated sectors under the Kyiv Protocol include the energy sector, production and processing of metals, the mineral industry, the chemical industry, waste and waste-water management, paper and wood production and processing, intensive livestock production and aquaculture, and animal and vegetable products from the food and beverage sector, among others.[155] This list has remained unchanged since 2003. Regulated activities covered 90 per cent of industrial emissions back in 2008.[156] Nowadays, due to a mismatch between regulated activities, pollutants, and waste disposal and recovery operations, significant sources of emissions and wastes are not covered.[157]

80. PIPs mostly capture data from point sources, such as facilities. Data collection or estimates from non-point or diffuse sources, such as consumer products, certain agricultural activities, transportation, and residential activities, is limited.[158] For example, pesticide use

[149] References to Kosovo shall be understood to be in the context of Security Council resolution 1244 (1999).
[150] Submission by Participatio Ltd.
[151] European Commission, REFIT evaluation of Regulation (EC) No 166/2006 concerning the establishment of a European Pollutant Release and Transfer Register (E-PRTR), document SWD (2017) 710 final, p. 3.
[152] Commission for Environmental Cooperation, “Action plan”, pp. 6–8 and 14.
[153] ECE/MP.PRTR/WG.1/2020/4, para. 23.
[154] Ibid., para. 124.
[155] Kyiv Protocol, annex I.
[156] ECE/MP.PRTR/WG.1/2019/6, para. 9.
[157] Ibid., para. 43.
[158] Kyiv Protocol, art. 7 (4), (7) and (8).

by certain agricultural activities is not accounted for, despite polluting water and even releasing greenhouse gases.[159] In particular, Latin America consumes roughly half of the agrochemicals produced worldwide, including chemistries that are banned in the European Union.[160] In addition, the toxicity and side effects of highly hazardous pesticides are frequently underestimated,[161] despite the efforts of some governments to eliminate them.[162]

81. Pollution from consumer products and manufactured materials are another example of limited reporting to PIPs.[163] Consumers may be exposed to pollutants from these diffuse sources at home, at work or in the environment.[164] Consumer products and manufactured materials may release pollutants not only when used, but throughout their entire life cycles and along their entire value chain. They may also release pollutants if and when they are recycled or disposed of.[165] However, most countries collecting or estimating data on diffuse sources do not account for this pollution.[166]

82. There are countries where owners/operators report on a voluntary basis. Such is the case of China, where it is reportedly difficult to persuade companies to willingly expose their own emissions and wastes when their competitors are not required to do so.[167] Another example is Romania, where data from waste generators is kept confidential, based on allegedly legitimate economic interests, intellectual property rights and data protection, even though publicity of such data is required under international standards.[168]

B. Limited quality of the information

83. One of the challenges facing PIPs is data quality. It is essential that good quality is ensured from the very moment of data collection or measurement. This could be achieved when reporting guidance documents and forms are easy to understand, and the system validates data and provides feedback automatically at different stages. Data collection and calculation methodologies also require continuous improvement. In federal countries, coordination between federal and local competent authorities through joint working groups helps ensure good data quality and management.[169]

C. Limited substance coverage

84. PIPs focus their coverage on a list of substances, which often include major greenhouse gases, acid rain pollutants, ozone-depleting substances, heavy metals, pesticides, polychlorinated biphenyls, volatile organic compounds, and dioxins.[170] However, PIPs may not always capture emerging pollutants or substances of emerging concern that have recently been identified as potential threats.[171]

85. In the case of Australia, for example, the list does not include perfluoroalkyl and polyfluoroalkyl substances, known as “forever chemicals” given their very high persistence.

[159] Submission by Child Rights International Network.
[160] Submission by Centro de Derechos Reproductivos.
[161] Gilles-Eric Seralini, “Pesticides in formulations: new revolutionary findings”, *Toxics*, vol. 12, No. 2 (2024).
[162] Submission by Mali (in French).
[163] Submissions by the Research Centre for Gender, Family and Environment in Development and Child Rights International Network.
[164] Submission by the Danish Consumer Council THINK Chemicals.
[165] Joint submission by Health and Environment Justice Support, Swedish Society for Nature Conservation and groundWork South Africa.
[166] ECE/MP.PRTR/2021/10, para. 57.
[167] Ma Jun and others, *Establishing a PRTR Disclosure System in China*, p. 36.
[168] ECE/MP.PRTR/2021/10, para. 131.
[169] ECE/MP.PRTR/2017/7, para. 25.
[170] Kyiv Protocol, annex II.
[171] Submission by Colectiva Malditos Plásticos (in Spanish).

These substances can cause cancer and immune system effects, even in low concentrations.[172] In Europe, reporting of perfluoroalkyl and polyfluoroalkyl substances is required, but the data are too generic.[173] Also, the Kyiv Protocol's list has remained unchanged since 2003. Therefore, amendments to national regulations or the Kyiv Protocol would enable the collection of more detailed data.

86. Since PIPs focus on emissions and wastes, emerging uses of products that release pollutants are often not regulated. According to the information received, nanomaterials, for example, are regulated in the European Union, but not in Mexico, where they have been found in at least 125 labelled consumer products, despite the risk of human absorption and environmental release.[174] Similarly, in Argentina, Brazil and Colombia, there is limited access to information on glyphosate, despite it having been classified as a probable carcinogen by the International Agency for Cancer Research of the World Health Organization.[175]

87. Plastics are a good example both of substances of emerging concern, and of products that release pollutants. Even though some plastic production activities were included in annex I of the Kyiv Protocol, and some pollutants used in plastic production were listed in annex II, microplastic and nanoplastic particles are not reported as part of particulate matter or diffuse sources. Current negotiations for a legally binding instrument on plastic pollution point to synergies with PIPs, based on a lifecycle approach.[176]

D. Lack of integration between platforms

88. Another limitation of many PIPs is their lack of integration with other environmental information platforms. This may be due to technical issues concerning data comparability and interoperability. Institutional frameworks and degrees of digitalization of government activities,[177] as well as data compatibility (i.e. different platforms using various data formats, standards, and structures) or technical compatibility issues (i.e. incompatible software, protocols, and infrastructure) may present obstacles to integration.[178]

89. Lack of integration may also result from differing mandates – for example, PRTRs under the Kyiv Protocol and PIPs under other multilateral environmental agreements. Moreover, while national PIPs may contain data on substances regulated by multilateral environmental agreements, evidence indicates that PIPs are not linked to national reporting requirements established under multilateral environmental agreements.[179]

90. Canada, for example, has compiled evidence supporting the need to integrate datasets to cover substance gaps, but this has yet to be implemented, for example with radionuclides emitted or disposed of at nuclear facilities, which are inventoried separately.[180]

E. Limited user-friendliness and accessibility

91. Technology and digital platforms or mobile applications provide the public with easy access to data through user-friendly interfaces, regardless of their scholarly level.[181] However,

[172] The National Institute for Occupational Safety and Health, "Per- and polyfluoroalkyl substances (PFAS)", available at https://www.cdc.gov/niosh/topics/pfas/default.html.

[173] ECE/MP.PRTR/WG.1/2022/6, para. 6.

[174] Joint submission by Latin American Network on Nanotechnologies and Society and International Pollutants Elimination Network.

[175] Submission by Centro de Derechos Reproductivos. See also World Health Organization, International Agency for Research on Cancer, "IARC Monographs Volume 112: evaluation of five organophosphate insecticides and herbicides", 20 March 2015, available at https://www.iarc.who.int/wp-content/uploads/2018/07/MonographVolume112-1.pdf.

[176] ECE/MP.PRTR/WG.1/2022/6, paras. 3, 4, 7 and 10.

[177] Submission by the secretariat of the Aarhus Convention and its Kyiv Protocol.

[178] Submission by Canada.

[179] ECE/MP.PRTR/WG.1/2020/4, section I.L.

[180] Submission by Canada.

[181] Submission by the European Commission.

even if this access is provided through PIP, it proves difficult for the public to process it due to its high technical complexity.[182] Real-time monitoring systems, community engagement and simplified data visualization can enhance comprehension of pollution data.[183]

F. Limited public awareness and participation

92. Meaningful public participation largely depends on public awareness, understanding and knowledge about why it is that the public should even care. However, the features of many existing PIPs limit their ability to engage the public and provide it with useful information. For example, the use of overly technical language, or the lack of explanation of the hazardous properties of substances, among other things, creates distance between PIPs and the public.

93. States can make PIPs more accessible, for example by using language that is easier to understand for the public. More accessibility also means building capacity to ensure that different sectors of society understand the information, by resorting to different ways of disseminating it.[184] This must be carried out with a gender approach,[185] and paying special attention to specific groups, including those in situations of vulnerability, such as Indigenous Peoples,[186] peasants and people working in rural areas, small-scale fishers, persons with disabilities,[187] children[188] and communities impacted by armed conflicts and military activities.[189]

VI. Conclusions and recommendations

94. Pollution information portals collect, contextualize and disseminate information on emissions and wastes to inform communities, scientists, businesses and regulators. These portals are thus vital tools for the realization of the right to a clean, healthy and sustainable environment and the right to science, among others. Moreover, by fostering strong environmental governance, public awareness and community empowerment, PIPs also advance the rights of access to information, public participation and justice in regard to pollution and exposure.

95. PIPs help governmental authorities assess risks, set priorities and create and improve regulations to avoid or reduce environmental and health risks and harms resulting from emissions and disposal of hazardous substances and wastes. They also help businesses discharge their due diligence responsibilities regarding the generation, management and emission of hazardous substances and wastes.

96. PIPs offer an important opportunity for channelling international cooperation in building capacities for achieving the Sustainable Development Goals. Many States lack PIPs, and others lack mandatory reporting. The 2023 Global Framework on Chemicals – For a Planet Free of Harm from Chemicals and Wastes makes a timely call on States to establish PRTRs. International agreements, such as the Aarhus Convention and its Kyiv Protocol, and more recently the Escazú Agreement, also place obligations on their respective parties to establish PIPs.

97. First-generation PIPs, such as PRTRs, basically are online platforms, accessible to the public, that provide data on the emissions and wastes from industrial and business activities and other sources. By contrast, new generation PIPs are entryways to information that allow users to transform data into knowledge.

[182] Submission by Chile.
[183] Submission by Litter Scout Youth Network.
[184] Submission by Chile.
[185] Submission by Centro de Derechos Reproductivos.
[186] Submission by Voices for Peace.
[187] Regional online consultation with Africa, Central Asia, Europe and the Middle East, 16 April 2024.
[188] Submission by Child Rights International Network.
[189] Submission by the Conflict and Environment Observatory.

98. A key feature of robust PIPs is having clear objectives on pollution prevention and the strengthening of environmental performance. Other good practices include covering both point and diffuse sources of pollution, going beyond the minimum standards of international instruments, ensuring comprehensive data collection, reporting and quality assurance, and using internationally approved methodologies. Integration with other environmental information systems and harmonized reporting methods can boost the usefulness of the information that is disseminated, while avoiding duplication.

99. Stakeholder engagement in the design and use of PIPs is key to enabling informed public participation in environmental decision-making. User-friendly and continuously updated databases that provide detailed, understandable data enhance public knowledge about hazardous substances and wastes. Continuous evaluation of the portals is another good practice to adapt to evolving needs and technological advancements.

100. A critical evaluation of existing PIP models highlights several gaps and shortcomings that limit their effectiveness. The lack of a clear pollution prevention and reduction mandate can have the unintended effect of normalizing pollution, encouraging a misplaced sense of complacency and confusing means and ends. Limited or non-mandatory reporting by businesses results in incomplete data, particularly from non-point sources such as consumer products and agricultural activities. Coverage of hazardous substances subject to reporting, especially in regard to emerging pollutants of concern, is often also limited. Lack of integration between PIPs and other platforms leads to fragmented data and missed opportunities for comprehensive environmental management. Lastly, public awareness and participation are often lacking due to passivity and overly technical language, which underscores the need for more accessible communication and proactive engagement.

101. **The Special Rapporteur recommends that States:**

(a) **Establish a PIP in their legislation, if they have still not done so;**

(b) **Provide support for capacity-building to States implementing PRTR systems, if in a position to do so, and explore partnering with other donors;**

(c) **Ensure that PIPs are aligned with national goals and international standards regarding pollution prevention and improvement of environmental standards;**

(d) **Expand the list of substances subject to reporting, to include emerging substances and wastes of concern, based on the best available science;**

(e) **Expand the range of activities subject to reporting, to include those known by the toxicity and side effects of their highly hazardous pollutants and wastes;**

(f) **Expand the range of sectors subject to reporting, to cover significant sources of emissions and wastes, routinely and in case of accidents;**

(g) **Establish the same thresholds for the same types of pollutants;**

(h) **Establish lower thresholds for certain types of substances that may be more hazardous for human health or the environment, including on the basis of the precautionary principle;**

(i) **Harmonize reporting methodologies to allow comparability and interoperability of data;**

(j) **Develop standardized methodologies to collect data from diffuse sources whose cumulative effects increase toxification;**

(k) **Verify and validate collected data to ensure quality;**

(l) **Conduct a continuous review of the best available science;**

(m) **Integrate PIP reporting with other national and international platforms and reporting obligations, including to avoid duplication of efforts;**

(n) **Provide public access not only to consolidated quantitative data, but also to the actual reports submitted by facilities, and to the estimates of diffuse sources by owners/operators and competent authorities;**

(o) **Expand the searchability and user-friendliness of online databases;**

(p) **Rely on real-time monitoring, community engagement and simplified data visualization techniques to enhance accessibility and comprehension;**

(q) **Use open-data and multimedia formats;**

(r) **Share good practices through dialogues, training sessions, workshops and other knowledge-exchange initiatives;**

(s) **Implement strategies to engage stakeholders and incentivize them to access and use the information;**

(t) **Ensure effective public participation in establishing and upgrading national PRTRs and in integrating user-feedback mechanisms, which provide possibilities to all interested users to comment on accessibility, content, quality, sustainability of use and reuse, as well as on issues or events that condition data interpretation;**

(u) **Provide regulators with all the necessary tools to ensure compliance and to enforce the legal obligations of business to report their emissions and wastes;**

(v) **Establish or strengthen, and implement, international agreements and arrangements, including by:**

(i) **Redoubling efforts at implementing the Global Framework on Chemicals – For a Planet Free of Harm from Chemicals and Wastes, particularly target B3;**

(ii) **Concluding a strong environmental rights framework in the Association of Southeast Asian Nations, including explicit commitments on PRTRs;**

(iii) **Discharging the obligation to take steps under the Escazú Agreement to establish PRTRs;**

(iv) **Updating and strengthening the Kyiv Protocol;**

(v) **Introducing effective language on a PRTR in the ongoing negotiations on a treaty on plastic pollution, including in the marine environment;**

(vi) **Introducing effective language on a PRTR in the ongoing negotiations on a treaty on business and human rights.**