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Final review report on the establishment of the Shared Environmental Information System

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**From Dobris to Nicosia: 30 years of environmental
cooperation in the pan-European region**

Final review report on the establishment of the Shared Environmental Information System

Summary of key messages and recommendations

Note by the Working Group on Environmental Monitoring and Assessment

Summary

At the Seventh Environment for Europe Ministerial Conference (Nur-Sultan, 21–23 September 2011), ministers requested that a Shared Environmental Information System be developed to underpin a regular environmental assessment process across the pan-European region.[a]

At the Eighth Environment for Europe Ministerial Conference (Batumi, Georgia, 8–10 June 2016), ministers invited countries to further develop their national information systems to have the Shared Environmental Information System in place by 2021 (ECE/BATUMI.CONF/2016/2/Add.1, para. 10).

At its twenty-fifth session (Geneva, 13–15 November 2019), the United Nations Economic Commission for Europe (ECE) Committee on Environmental Policy invited the Working Group on Environmental Monitoring and Assessment to oversee the preparation of a final review report on the establishment of the Shared Environmental Information System in Europe and Central Asia for consideration by the Committee, with a view to its subsequent forwarding to the next Environment for Europe Ministerial Conference as an information document (ECE/CEP/2019/15, para. 37 (j)).

At its twenty-seventh session (Geneva (hybrid), 3–5 November 2021), the Committee welcomed the final review report on the establishment of the Shared Environmental Information System (ECE/CEP/AC.10/2021/6) and forwarded it to the Ninth Environment for Europe Ministerial Conference (Nicosia, 5–7 October 2022). The report is provided in annex to the present document.

The Working Group, at its twenty-fourth session (Geneva (hybrid), 11–12 April 2022), discussed and approved additional key messages and recommendations related to the Shared Environmental Information System, including from the pan-European environmental

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assessment. At its special session (Geneva, 9–12 May 2022), the Committee welcomed the information provided by the secretariat on the key messages and recommendations.[b]

This document summarizes the key messages and recommendations, and serves as a basis for discussion and decision-making together with the final review report during the Ninth Environment for Europe Ministerial Conference.

[a] ECE/ASTANA.CONF/2011/2/Add.1, para. 14.
[b] ECE/CEP/S/2022/2, para. 26 (g).

Key messages and recommendations related to the progress in establishing a Shared Environmental Information System

A.   Key messages

1.   The main messages that the Working Group on Environmental Monitoring and Assessment wishes to convey to ministers at the Ninth Environment for Europe Ministerial Conference (Nicosia, 5–7 October) are set out below.

2.   Overall, a Shared Environmental Information System has been successfully established in Europe and Central Asia.

3.   All United Nations Economic Commission for Europe (ECE) member States have, to varying degrees, made progress regarding the establishment of a national system during the past years, and in making environmental information available and accessible.

4.   National Shared Environmental Information Systems vary in form and regularity regarding their updates and content, and gaps remain for all principles and pillars of the Shared Environmental Information System that need to be addressed.

5.   Availability of and access to information and knowledge to support government decision-makers, industry and the public making impact-oriented choices are improving but continue to be challenging in some sectors more than in others.

6.   Challenges remain regarding measuring progress towards policy targets in the pan-European region, including for emerging policy developments such as circular economy or sustainable infrastructure, as revealed during the development of the seventh pan-European environmental assessment.

7.   The seventh pan-European environmental assessment reveals various data gaps across the region in almost all areas, with data available for some countries but not others, or no recent data available. Data for some indicators needed for the assessment are not routinely collected, in particular for emerging policies, including the two conference themes.

8.   The System is not a static instrument and will need to evolve over time into fully integrated and open data systems based on the System's principles, and adapt to future developments in order to inform policies and the public holistically, including through applying the ECE revised indicators and other relevant indicator frameworks.

9.   Future digitalization of environmental data management and use of new technologies will be key.

10.   Countries still need assistance to fully implement all pillars and principles of the System for full production and sharing of all data flows associated with the ECE environmental indicators.[1]

11.   It is important that countries understand the Shared Environmental Information System as part of their regular internal environmental monitoring process. Such an approach will effectively guide any future developments and ensure that quantifiable progress can be made in the System.

12.   Further reviews of implementation of the Shared Environmental Information System would help to address gaps and, by doing so, ensure that it supports regular assessments and reporting in the future.

B.   Recommendations

13.   Based on the key findings and results of the final review report on the establishment of the Shared Environmental Information System in Europe and Central Asia (see annex to present document) and findings of the seventh pan-European environmental assessment, the

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[1] See the online Guidelines for the Application of Environmental Indicators, available at https://unece.org/guidelines-application-environmental-indicators.

Working Group recommends that countries address remaining gaps in the implementation of the Shared Environmental Information System, covering relevant pillars, thematic categories and data flows.

Infrastructure pillar

14.   In addition, in relation to infrastructure, Governments should:

        (a)   Improve national legislation and close legislative gaps still existing for monitoring and reporting related to certain environmental themes;

        (b)   Enhance digitalization of environmental data management, thus supporting several member States' efforts in implementing their digital agendas and implementation of digital environmental information systems in line with Shared Environmental Information System principles to further enhance the availability and accessibility of high-quality environmental data;

        (c)   Enhance the use of new technologies in environmental monitoring and production of environmental data (such as big data, the Internet of Things and artificial intelligence);

        (d)   Ensure that sufficient financial resources are allocated to the further development, operation and maintenance of environmental monitoring and information systems through national budgets and/or international support;

        (e)   Invest in data collection and information processing, as knowledge is instrumental in decision-making, including for water policy design (e.g., water accounts, ecosystem assessment and indicators); for example, continuous improvement of monitoring and communication technologies is considered a top priority in terms of a water information system for the pan-European region.

Content pillar

15.   In relation to content, Governments should:

        (a)   Align the Shared Environmental Information System with the revised ECE environmental indicators to enhance their policy relevance;

        (b)   Regularly revise relevant indicators and data flows to inform the latest policies and to support decision-making related to the 2030 Agenda for Sustainable Development, a green and circular economy and other global policies;

        (c)   Continue to work on the integration and harmonization of environmental data flows in line with the principles of the Shared Environmental Information System;

        (d)   Better align data-collection processes with national policy contexts and targets and improve the use of available data flows and related indicators in the production of environmental assessments and reports, including for the pan-European environmental assessment;

        (e)   Improve the use of relevant environmental assessments and reports to measure progress against policy targets and objectives, and improve policymaking;

        (f)   Bring policy and science together to develop appropriate and standardized methods and systems for monitoring and information management, including through application of new technologies, to fill data gaps and improve decision-making;

        (g)   Promote use of appropriate and standardized methods, particularly for monitoring air pollution emissions, and public availability of monitoring data, while strengthening cooperation and national investment to fill monitoring gaps;

        (h)   Enhance regular data production and timely availability and publication of information online in accordance with the System's principles;

        (i)   Increase efforts to complement inventories of beach and marine litter with information on composition and sources of litter;

(j)   Establish a region-wide chemicals and waste impact-oriented monitoring scheme;

(k)   Improve data-collection systems on environmental financing, for example, on environmental expenditures (which entities spend money on the environment, how much, with what objectives and who finances these expenditures);

(l)   Develop a common definition of "sustainable infrastructure" to allow reporting on and quantifying of progress across countries and subregions;

(m)   Select some specific key-impact tourism indicators to be included in ECE statistical databases and align them with those being developed for the monitoring of sustainable development in tourism, ensuring that they are compatible with the Sustainable Development Goals.

Cooperation pillar

16.   In relation to cooperation, Governments should:

(a)   Establish or improve institutional arrangements for regular production and sharing of data between various institutions at the national level, including for the monitoring of the Sustainable Development Goals and a green and circular economy;

(b)   Encourage environmental authorities to work closely with their corresponding national statistical agencies and other relevant institutions to integrate and share information.

17.   The Working Group also recommends that ECE, the United Nations Environment Programme and the European Environment Agency continue their long-standing and effective cooperation in support of the implementation of the Shared Environmental Information System in Europe and Central Asia. These organizations should also actively support countries in regular reviews of environmental information systems and their digitalization efforts.

18.   These recommendations may need to be revised in the future, based on future reviews that may be conducted by countries.

Annex

Final review report on the establishment of the Shared Environmental Information System

I. Introduction

1.   The availability, timeliness and quality of relevant information form a solid foundation for sound policymaking and provide factual evidence on whether policy is effective in the long term. The availability of information also represents a powerful tool against the degree of uncertainty surrounding many issues requiring governance, while also enhancing public participation and awareness if that information is made public and easily accessible. This is particularly true when it comes to the preservation and improvement of environmental conditions, the formulation of sound environmental policy at all levels of governance, the attainment of global targets such as the Sustainable Development Goals and sound state-of-the-environment reporting at the national level.

2.   Based on this rationale, in 2008, the European Commission set up a policy instrument known as the Shared Environmental Information System. This development was a clear response to the need for an integrated platform for the sharing of environmental data and experiences in developing knowledge-based environmental policy and a knowledge-based economy, making such data accessible to a vast array of users to increase environmental awareness and increasing the efficiency of environmental data production to inform decision-making. The Shared Environmental Information System should facilitate regular environmental assessments and reporting. At its heart are existing data and information flows relevant at the country and international levels. These flows should be linked with the support of modern technologies, such as the Internet, and shared between existing networks.

3.   Subsequently, the Shared Environmental Information System has not only expanded geographically in its scope but has also evolved into a multi-actor governance structure. A number of regional agencies and international organizations are operating and cooperating towards implementing the System: the European Environment Agency, the United Nations Economic Commission for Europe (ECE) and the United Nations Environment Programme (UNEP) have gradually undertaken leading roles in jointly implementing the System across the pan-European region, working closely with national authorities to harmonize and make available and accessible environmental data.

4.   The goal of the Shared Environmental Information System is to create an improved, decentralized system for the simplification, streamlining and modernization of existing environmental information-gathering systems. Such a system would improve the quality and facilitate the availability, accessibility and harmonization of environmental data. To meet this objective, the European Commission set out a list of seven principles underpinning the framework and operating mechanism of the Shared Environmental Information System.[2]

5.   The Shared Environmental Information System is thus based on three particular aspects of data quality: accessibility, interpretability and coherence of data. Accessibility relates to the degree of ease with which different users can access particular data and the sustainability of the means through which information is made available. The Shared Environmental Information System aims to move away from paper-based reporting and take full advantage of the latest information and communication technologies to provide a common platform for data derived from different sources, enabling harmonization, multi-purpose use and compatibility. Interpretability requires the availability of information that will help provide insights into the data collected. Lastly, coherence refers to consistency in data collection, production and release and comparability of data to broader analytical frameworks. Based on these combined aspects, the Shared Environmental Information

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[2] See Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions, Brussels, 1 February 2008, COM(2008) 46 final, "Towards a Shared Environmental Information System (SEIS)", pp. 2 and 3. Available at https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0046:FIN:EN:PDF.

System provides a powerful tool to improve data monitoring and sharing to provide better state-of-the-environment reports and sounder policy for the environment.

6.   The Shared Environmental Information System is a set of principles, operationalized as a distributed environmental information system that is connected and integrated with the help of modern technologies. Reinforcing and building upon the principles of the Shared Environmental Information System, the European Environment Agency established three pillars defining the core elements needed for an effective and functional Shared Environmental Information System. These pillars are content, infrastructure and cooperation.

7.   Content refers to the type of content required and the identification of potential sources to acquire such content. It also comprises information necessary to understand the changes in the state-of-the-environment as per specific thematic areas (for example, air, water and waste) and the interlinkages between them (as also addressed under the multilateral environmental agreements). Such data are available from various institutions at various levels and are crucial in terms of policymaking, but also awareness-raising. They need to follow agreed, common format requirements, at least for those data and information constituting international flows.

8.   Infrastructure refers to an effective, web-enabled technical infrastructure, taking full advantage of pioneering information and communication technologies, including web services, to provide easy access to a wide range of environmental information and data flows so that they can be accessed by users, including experts, who can analyse the information and share it for further use.

9.   Cooperation refers to the need for positive interaction between relevant actors at the various levels in the country and the designation of governance structures to manage human resources, inputs and networking. This pillar includes issues such as development or amendment of the legal framework and data policy agreements and protocols to enable data exchange, cooperation and coordination, while ensuring trust building and confidence between various data providers and between them and users.

10.   The Shared Environmental Information System operates based on data flows belonging to particular environmental indicators compliant with international standards. In collaboration with the European Environment Agency, the ECE Working Group on Environmental Monitoring and Assessment agreed in 2007 upon a set of environmental indicators and their guidelines for application, eventually falling under 10 environmental thematic areas and comprising 49 indicators – the ECE Environmental Indicators.[3]

11.   The governance of the Shared Environmental Information System involves a high degree of cooperation between international organizations, regional agencies, member States, national environmental authorities and other relevant stakeholders. The European Commission through the European Environment Agency, ECE and UNEP each play a role in the establishment and governance of the Shared Environmental Information System.

12.   The European Environment Agency has been one of the leading proponents and major operators of the Shared Environmental Information System since the beginning. It has taken a leading role in laying out the core components of a functioning System. The European Environment Agency has led the projects supporting the implementation of the principles funded by the European Union European Neighbourhood Instrument since 2011, focusing on the European Neighbourhood countries in Eastern Europe and the Caucasus.

13.   ECE has had an increasing role in the governance and practical implementation of the Shared Environmental Information System across the pan-European region through several of its processes, tools and bodies dedicated to environmental policy and, more specifically, environmental monitoring and assessment. These include the Committee on Environmental Policy, the Environment for Europe Ministerial process, the Working Group on Environmental Monitoring and Assessment, the Joint Task Force on Environmental Statistics

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[3] See the online Guidelines for the Application of Environmental Indicators, available at https://unece.org/guidelines-application-environmental-indicators.

and Indicators and the use of ECE environmental indicators in the harmonization of environmental data across the ECE region.

14.   UNEP has supported a variety of processes concerning the Shared Environmental Information System since its inception, collaborating with the European Environment Agency and ECE in the development of environmental indicators and the practical implementation of the Shared Environmental Information System across the pan-European region.

15.   At the Seventh Environment for Europe Ministerial Conference (Nur-Sultan, 21–23 September 2011), ministers requested that a Shared Environmental Information System be developed to underpin a regular environment assessment process across the pan-European region (ECE/ASTANA.CONF/2011/2/Add.1, para. 14). More recently, at the Eighth Environment for Europe Ministerial Conference (Batumi, Georgia, 8–10 June 2016), ministers welcomed progress in developing the Shared Environmental Information System, but reiterated the need for countries to continue their efforts and to further develop their national information systems to have the System in place in the countries of Europe and Central Asia by 2021 (ECE/BATUMI.CONF/2016/2/Add.1, para. 10).

16.   To assess progress in the implementation of the System and other outcomes of the Batumi Conference, ministers invited the Committee on Environmental Policy to convene, in 2018, a mid-term review to assess progress in the implementation of the main outcomes of the Conference (ECE/BATUMI.CONF/2016/2/Add.1, para. 16), including the development of the Shared Environmental Information System to support a regular process of environmental assessment.

17.   At its twenty-fourth session (Geneva, 29–31 January 2019), the Committee on Environmental Policy welcomed the mid-term review report on the establishment of the Shared Environmental Information System (ECE/CEP/2019/7) prepared by the Working Group. The Committee also requested the Working Group to lead a further review of progress in establishing the System in Europe and Central Asia in advance of the next Environment for Europe Ministerial Conference (ECE/CEP/2019/2, para. 27).

18.   ECE member States, with the support of the secretariat and partner organizations, have made progress in establishing the Shared Environmental Information System since then, and there is a renewed and strengthened momentum for environmental monitoring and assessment in the lead up to the next Ministerial Conference in October 2022.

19.   This final progress review report aims to inform the Environment for Europe Ministerial Conference on the status of establishment of the Shared Environmental Information System in Europe and Central Asia.

20.   The report presents the results of collected data for 22 data flows based on an assessment framework (ECE/CEP–CES/GE.1/2019/3) developed by the Working Group in close cooperation with ECE, UNEP and the European Environment Agency. The assessment framework focuses on the quality of the ECE environmental indicators (relevance, accuracy, timeliness and punctuality, clarity, comparability of data and institutional and organizational arrangements) and addresses limitations associated with the earlier assessment in 2016[4] and the mid-term review conducted in 2018.

21.   The purpose of the review is to show progress against agreed data quality criteria in order to allow countries to assess their capacities and help identify resource needs for regular environmental monitoring and assessment. Many other initiatives and projects have in parallel supported the establishment of environmental information systems applying the principles of the Shared Environmental Information System and have significantly contributed to the establishment of the System. Other initiatives include national reforms to improve information systems, several dedicated projects implemented by the European Environment Agency, projects implemented by UNEP in Central Asia and an open data-related project implemented by the ECE secretariat of the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental

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[4] Report on progress in establishing the Shared Environmental Information System in support of regular reporting in the pan-European region (ECE/BATUMI.CONF/2016/8).

Matters together with the European Environment Agency. The European Environment Information and Observation Network – a partnership network of the European Environment Agency and its member and cooperating countries – has significantly complemented the establishment of the Shared Environmental Information System in member and cooperating countries of the European Environment Agency.

22.   The present report was prepared using an online reporting tool developed by UNEP based on the assessment framework. The report builds on countries' responses to a self-assessment questionnaire, as part of the assessment framework, covering seven quality categories that are associated with data production and use of the ECE environmental indicators. These are: relevance; accuracy; timeliness and punctuality; accessibility; clarity; comparability; and institutional and organizational arrangements. The present final review addresses all three pillars of the Shared Environmental Information System — content, infrastructure and cooperation — and all seven of its principles, unlike previous assessments. The final report will be presented at the Ninth Environment for Europe Ministerial Conference in October 2022. The provision of timely, relevant and reliable information and indicators to policymakers and the public remains crucial for the Working Group and future Environment for Europe Ministerial Conferences.

23.   The review is based upon self-assessments submitted by 21 of the 53 ECE member States in Europe and Central Asia:[5] Albania, Austria, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, France, Georgia, Germany, Kazakhstan, Montenegro, North Macedonia, Republic of Moldova, Romania, Serbia, Slovakia, Spain, Sweden, Switzerland and Uzbekistan. While all member States with economies in transition submitted self-assessments for the 2018 mid-term review, only moderate participation, in particular from Central Asia, was noted for the final review. Compared to the draft final review report presented in October 2020, only three more countries submitted their self-assessments.

24.   The present document is limited to the review of 22 data flows underpinning the 18 ECE core environmental indicators and covering 9 environmental themes. The themes, indicators and data flows that were reviewed are shown in table 1 below. Questions to member States to assess data quality covered the following areas: improvements since the 2018 mid-term review report; indicator-based and integrated state-of-the-environment reports; handling of user feedback; multiple use of data, data sources and formats; data validation and revision; timeliness, punctuality; accessibility and availability of data; policy link; metadata; comparability of data; national legislation; and institutional arrangements.

25.   More information on the assessment framework for the Shared Environmental Information System and data collection for the final progress review is provided in document ECE/CEP/AC.10/2021/6, annex.

Table 1
Reviewed themes, core indicators and data flows

Theme	Core indicators	Data flows
A. Air pollution and ozone depletion	A1. Emissions of pollutants into the atmospheric air	Emissions of sulphur expressed in sulphur dioxide (total, stationary and mobile sources)
		Emissions of PM_{10} (total, stationary and mobile sources)
		Emissions of $PM_{2.5}$ (total, stationary and mobile sources)

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[5]   The 56 United Nations Economic Commission for Europe (ECE) member States, excepting Canada, Israel and the United States of America.

Theme	Core indicators	Data flows
	A2. Ambient air quality in urban areas	Annual average concentration of sulphur dioxide – validated
		Annual average concentration of PM_{10} – validated
	A3. Consumption of ozone-depleting substances	Total ozone-depleting potential of chlorofluorocarbons
B. Climate change	B3. Greenhouse gas emissions	Aggregated greenhouse gas emissions, including emissions/removals from land use, land-use change and forestry
C. Water	C1. Renewable freshwater resources	Total renewable freshwater resources
	C2. Freshwater abstraction	Total freshwater abstraction (per river basin, season and year)
		Total freshwater use
	C10. BOD and concentration of ammonium in rivers	Mean concentration of BOD after five days of incubation in major rivers
	C11. Nutrients in freshwater	Mean concentration of phosphates in major rivers
D. Biodiversity	D1. Protected areas	Total protected areas by International Union for Conservation of Nature categories
	D4. Threatened and protected species	Number of species threatened — mammals, birds, fish, reptiles, amphibians, invertebrates, vascular plants, mosses, lichens, fungi, algae
E. Land and soil	E1. Land uptake	Total land uptake
F. Agriculture	F2. Fertilizer consumption	Total consumption of mineral fertilizers
G. Energy	G1. Final energy consumption	Total final energy consumption
	G2. Total primary energy supply	Total primary energy supply (production, export, import, bins, stock changes)
	G3. Energy intensity	Final energy consumption/gross domestic product
	G4. Renewable energy consumption	Total primary energy supply by renewable energy category

Theme	Core indicators	Data flows
		(hydropower, biomass, biofuels, wind, solar, geothermal, other)
H. Transport	H1. Passenger transport demand	Road transport (private cars, public transport, long-distance public transport)
I. Waste	I1. Waste generation	Total waste generation

Abbreviations: BOD, biochemical oxygen demand; PM, particulate matter less in diameter than the number of micrometres shown in the subscript.

II. Overview of main achievements and key findings

26.   The main message that the Working Group wishes to convey to ministers of Environment at the Ninth Environment for Europe Ministerial Conference is that, overall, a Shared Environmental Information System has been successfully established in Europe and Central Asia. All member States have, to varying degrees, made progress regarding the establishment of a national system during the past years and in making environmental information available and accessible. National Shared Environmental Information Systems vary in form and regularity regarding their updates and content, and gaps remain that need to be addressed.

27.   While all member States have made progress in making environmental information publicly available, it is difficult to confirm full establishment of a national system in all countries in line with all Shared Environmental Information System principles and pillars due to the limited number of self-assessments submitted.

28.   The System is not a static instrument and will need to evolve over time into fully integrated and open data systems based on the System's principles and adapt to future developments in order to inform policies and the public holistically. Future digitalization of environmental data and use of new technologies will be key given the overall efforts of many countries to increase digitalization including in the field of environment (digital environmental information systems).

A. Working Group recommendations

29.   Based on key findings and results of the present draft assessment based on the 21 submissions by member States, as presented in the sections below, the Working Group recommends that countries:

(a)   Improve national legislation in place and close legislative gaps (for 13 per cent of thematic areas assessed during this review), where still existing for monitoring and reporting related to certain environmental themes;

(b)   Continue work on the integration and harmonization of environmental data flows, in line with the principles of the Shared Environmental Information System beyond 2021;

(c)   Enhance regular data production and the publication of environmental information online in accordance with the System's principles;

(d)   Enhance digitalization of environmental data, thus supporting several member States' efforts in implementing their digital agendas and implementation of digital environmental information systems in line with Shared Environmental Information System principles to further enhance the availability and accessibility of high-quality environmental data;

(e)   Enhance the use of new technologies in environmental monitoring and production of environmental data (such as big data, the Internet of Things and artificial intelligence);

(f)   Establish or improve institutional arrangements for regular production and sharing of data between various institutions at the national level, including for the monitoring of the Sustainable Development Goals and a green and circular economy. Environmental authorities are encouraged to work closely with their corresponding national statistical agencies and other relevant institutions to integrate and share information;

(g)   Better align data-collection processes with national policy contexts and targets and improve the use of available data flows and related indicators in the production of environmental assessments and reports including for the pan-European environmental assessment;

(h)   Improve the use of relevant environmental assessments and reports to measure progress against policy targets and objectives and improve policymaking;

(i)   Regularly revise relevant indicators and data flows to inform the latest policies and to support decision-making related to the 2030 Agenda for Sustainable Development, a green and circular economy and other global policies;

(j)   Address remaining gaps in the establishment of the Shared Environmental Information System, covering relevant pillars, thematic categories and data flows;

(k)   Ensure that sufficient financial resources are allocated to the establishment, operation and maintenance of environmental monitoring and information systems through national budgets and/or international support.

30.   These recommendations may need to be revised in the future based on future reviews that may be conducted by countries.

31.   The Working Group also recommends that ECE, UNEP and the European Environmental Agency continue their long-standing and effective cooperation in support of the establishment of the Shared Environmental Information System in Europe and Central Asia. These organizations should also actively support countries in regular reviews of environmental information systems and their digitalization efforts.

B.   Key findings

32.   The self-assessments confirm that many countries have continued to harmonize relevant data flows and improve the quality of the selected environmental indicators and underpinning data flows since the mid-term review. This demonstrates a positive trend since 2018.

33.   Preliminary results reveal that theme I (Waste) has the highest performance scores, followed by B (Climate change), G (Energy), H (Transport), D (Biodiversity), A (Air pollution and ozone depletion), C (Water), F (Agriculture) and E (Land and soil). At the indicator and data flow level, "Total waste generation" performed best, followed by "Annual average concentration of sulphur dioxide – validated", "Annual average concentration of PM_{10} – validated", "Aggregated greenhouse gas emissions including emissions/removals from land use, land-use change and forestry" and "Total protected areas by International Union for Conservation of Nature categories". Lowest performance was reported for "Total ozone depleting potential of chlorofluorocarbons", "Emissions of $PM_{2.5}$ (total, stationary and mobile sources)" and "Total renewable freshwater resources" (see document ECE/CEP/AC.10/2021/6, annex, for further details on performance scores).

34.   The majority of the data flows (80 per cent) are used for more than one purpose, including for national and international reporting obligations such as state-of-the-environment reports, thematic reports, reporting under multilateral environmental agreements, European Environment Agency/European Environment Information and Observation Network data flow reporting, and for the production of indicators. All reporting countries except two stated that the data flows of "Annual average concentration of sulphur

dioxide – validated", "Annual average concentration of PM_{10} – validated",[6] "Total protected areas by International Union for Conservation of Nature categories", "Aggregated greenhouse gas emissions including emissions/removals from land use, land-use change and forestry" and "Total waste generation" are used for multiple purposes and thus performed best, followed by the data flows "Mean concentration of BOD after five days of incubation in major rivers", "Mean concentration of phosphates in major rivers", "Total freshwater use", "Final energy consumption/gross domestic product", "Total final energy consumption" and "Total consumption of mineral fertilizers". While these are positive developments, there is still room for improvement for other data flows to fully comply with the Shared Environmental Information System principles. The data flow "Emissions of $PM_{2.5}$ (total, stationary and mobile sources)"[7] performed worst, with only 11 countries using the data flow for multiple purposes. The majority (62 per cent) of countries that submitted a self-assessment regularly (annually, every second year or every four or five years) produce an indicator-based national state-of-the-environment report. Twenty-nine per cent of countries do not produce an indicator-based report or not with regular frequency, and 10 per cent did not respond to this question. A very positive development in recent years is that most countries (81 per cent) produce integrated environmental reports covering several thematic areas. Please see table 4 below, which was completed with additional research for countries that did not submit a self-assessment.

35.   These positive developments over the past years demonstrate the inherent value of continued monitoring of the establishment of the Shared Environmental Information System through regular self-assessment of progress, particularly as the System improves the production, the quality and, especially, the use of relevant environmental data flows across multiple contexts, bodies of knowledge and policymaking approaches. Multiple use of data flows should be further fostered, including for integrated policies, the pan-European environmental assessment and other assessments and through enhanced partnerships between countries and international organizations.

36.   Limitations still exist in comparing several data flows across subregions or between countries, including "Emissions of sulphur expressed in sulphur dioxide (total, stationary and mobile sources)", "Annual average concentration of sulphur dioxide – validated" and "Aggregated greenhouse gas emissions including emissions/removals from land use, land-use change and forestry". Another prominent example remains that of total protected areas. The relatively low performance in terms of comparability may partly be due to the fact that several countries have not provided information on time series or links to data flows, which did not allow for a full comparison.

37.   Some gaps also remain related to linking data flow(s) to national policy targets. While many of the 21 countries that reported indicated how data flows are linked to policy targets, for some data flows, no information was provided for certain thematic areas by some countries.

38.   Several countries (38 per cent) have established an integrated environmental information/data portal. The remaining countries either have several platforms or websites with environmental information in place or did not reply.

39.   These findings will need to be revised for any future reviews on the implementation of Shared and Digital Environmental Information Systems beyond 2021.

C.   Pillars of the Shared Environmental Information System

40.   The Shared Environmental Information System is a set of principles, operationalized as a distributed environmental information system that is connected and integrated with the help of modern technologies. The System's pillars reinforce the importance of linking environmental data flows, networks, policymakers and governance. Like for the mid-term

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[6] Particulate matter (PM) less than 10 micrometres in diameter.
[7] Particulate matter less than 2.5 micrometres in diameter.

review, all three pillars are considered within the final progress review report to account for the entire data value chain.

1. Content

41. Countries reported that nearly all 22 data flows are published regularly (85 per cent). In most cases, data flows are published annually. This is a very positive development and confirms the added value of the Shared Environmental Information System as a continuous source of high-quality information and data for decision makers and the public.

42. The data flows are most often presented as complete factsheets (67 per cent) and are used to produce different types of content such as reports and visual representations. This too is a positive development.

2. Infrastructure

43. The majority of the 22 data flows (72 per cent) are readily available and accessible online for users on national platforms. This suggests a positive development regarding the principles of accessibility and availability of the data flows, in part due to efforts to establish the System.

44. In 8 countries, the 22 data flows are readily available and accessible on integrated platforms, with remaining limitations for some data flows, for 11 countries various platforms exist or links were provided and 2 countries did not provide information. As remarked in the mid-term review, inconsistencies have been found in the self-assessments regarding links provided for the individual data flows, as some are not operational or do not indicate the data flow but rather a general source or platform (ECE/CEP/2019/7, para. 18). Progress could be seen in countries participating in the European Neighbourhood Instrument Shared Environmental Information System II East project implemented by the European Environment Agency, as many indicators were available at one platform. Other positive examples are Kazakhstan and Switzerland.

45. Most countries that have submitted a self-assessment have established procedures for data validation and revision for all 22 data flows. For 69 per cent of data flows, validation procedures were reported, and for 58 per cent of data flows, procedures for data revision are in place. While this result implies that the trustworthiness of data has increased over the past years, there are still inconsistencies remaining regarding some countries' replies. Some countries have formal procedures in place and apply international standards for data validation, while other countries follow internal validation practices without having them formalized.

46. According to the reports received, metadata are available for 71 per cent of the 22 data flows, thus ensuring greater clarity and quality of the information provided. Gaps remain in particular for data flows such as "Total renewable freshwater resources", "Total ozone depleting potential (ODP) of chlorofluorocarbons (CFCs)", "Emissions of PM_{10} and $PM_{2.5}$ (total, stationary and mobile sources)", "Total consumption of mineral fertilizers", "Number of species threatened" and "Energy intensity: final energy consumption/ [gross domestic product] GDP".

3. Cooperation

47. Countries reported having in place institutional arrangements for the regular production and sharing of data between various institutions at the national level (67 per cent). Improvements are still needed for all themes, particularly for: Agriculture; Air pollution and ozone depletion; Biodiversity; Land and soil; and Transport. Interaction between relevant actors at the local, regional and national levels and efficient governance to manage human resources, inputs and networking are crucial.

48. During the mid-term review, the need to improve institutional cooperation between fragmented data producers and users was highlighted. The continued process of establishment of the Shared Environmental Information System, the self-assessment questionnaire and the final progress review facilitated further interaction between data producers who normally do not share or exchange information. This demonstrates the added

value of the Shared Environmental Information System as an instrument that can improve interaction and communication between data producers (ECE/CEP/2019/7, para. 21). This work should continue to ensure in full efficient interaction between the various stakeholders.

49.   Since the mid-term review in 2018 several positive developments have been noted as shown in the box below.

50.   Several partners have complemented the work on the Shared Environmental Information System, thus contributing significantly to its establishment. The European Environment Information and Observation Network, for example, has been leading on environmental reporting in member countries of the European Environment Agency and its cooperating countries. During the final review on the Shared Environmental Information System, low participation, particularly from European Union member States, has been noted. However, table 2 below on the history of data reporting performance, compiled by the European Environment Information and Observation Network, shows that good progress has been achieved in environmental reporting and the establishment of environmental information systems in these countries. Nevertheless, gaps remain in most of the countries shown in the table. This was also confirmed in the final review on the Shared Environmental Information Systems for the European Union member States and cooperating countries of the European Environment Agency that submitted a self-assessment.

Developments since the mid-term review report conducted in 2018

In all, 16 of 21 member States reported having taken steps since the 2018 mid-term review to further the Shared Environmental Information System, 3 reported that no steps had been taken and 2 did not reply.

Steps taken by member States included: (a) updating and production of environmental data and indicators; (b) preparations for or development of a state-of-the-environment report; (c) enhanced cooperation with relevant agencies on the Shared Environmental Information System and open data portals; (d) creation of new, or restructuring or updating of, existing national environmental data portals; (e) integration and sharing of environmental data sets at national portals in line with the INSPIRE Directive;[a] and (f) establishment of an open data portal with geospatial data. Several countries in the European Union Eastern Neighbourhood region highlighted that establishment of the Shared Environmental Information System had been enhanced through support provided by the European Neighbourhood Instrument Shared Environmental Information System II East project[b] implemented by the European Environment Agency. Moreover, other member States listed projects supporting the improvement of environmental monitoring and establishment of the Shared Environmental Information System, for example, the project "Development of Environmental Monitoring and Information System", financed by the European Union Instrument for Pre-Accession Assistance II programme in North Macedonia, or the United Nations Development Programme project "Establishing Albania's Environmental Information Management and Monitoring System Aligned with the Global Reporting".

While in the mid-term review report only seven data flows were reviewed, the final progress review provides a more holistic and complete picture regarding accessibility and availability of data, and data quality, at least for those countries submitting self-assessments. However, the report also reveals limitations in using certain data flows, such as "Emissions of PM_{10} (total, stationary and mobile sources)", "Emissions of $PM_{2.5}$ (total, stationary and mobile sources)" and "Total ozone depleting potential of chlorofluorocarbons" for multiple purposes. Several countries did not specify the use of certain data flows or indicators for national/international reporting obligations or environmental policymaking, for example, tracking progress towards policy targets, and reporting on implementation of the Sustainable Development Goals.

[a] Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE), *Official Journal of the European Union*, L 108 (2007), pp. 1–14.
[b] See https://eni-seis.eionet.europa.eu/east.

Table 2

History of data reporting performance of European Environment Agency member countries and cooperating countries

(Percentage)

Country	2010	2014	2019
Albania	53	45	72
Austria	95	96	96
Belgium	90	93	96
Bosnia and Herzegovina	50	10	50
Bulgaria	92	96	85
Croatia	92	88	90
Cyprus	73	70	77
Czechia	85	92	90
Denmark	92	71	79
Estonia	98	96	98
Finland	83	89	88
France	96	80	98
Germany	98	96	83
Greece	58	61	60
Hungary	41	75	67
Iceland	75	50	81
Ireland	90	96	100
Italy	60	68	90
Latvia	96	86	90
Liechtenstein	82	45	9
Lithuania	94	86	77
Luxembourg	63	96	81
Malta	34	64	69
Montenegro	44	30	44
Netherlands	88	93	90
North Macedonia	69	81	100
Norway	90	92	86
Poland	79	89	79
Portugal	90	82	73
Romania	92	82	52
Serbia	75	90	100
Slovakia	82	96	100
Slovenia	96	89	90
Spain	85	96	100
Sweden	98	96	100
Switzerland	94	95	100
Türkiye	64	35	32
United Kingdom	98	89	92

Source: Core data flows of the European Environment Information and Observation Network, European Environment Agency.

Note: The European Environment Information and Observation Network is a partnership network of the European Environment Agency and its member countries and cooperating countries. It regularly reviews countries' performance in reporting priority data flows to support them in

identifying and prioritizing resources needs for regular reporting. In 2019, the European Environment Information and Observation Network reviewed 12 core data flows. The above table shows the reporting performance in 2010, 2014 and 2019. A score of 100 per cent indicates timely and high-quality data deliveries across all covered data flows.

III. Lessons learned and challenges

51. The final progress review report is a milestone in reviewing the Shared Environmental Information System's establishment in preparation for the Ninth Environment for Europe Ministerial Conference. While a 2016 assessment (ECE/BATUMI.CONF/2016/8) did not address data quality aspects and the mid-term review was limited to 3 indicators and 3 data flows, the final progress review considered 22 data flows covering 18 ECE core environmental indicators across 9 environmental themes by using the updated assessment framework. It considers the System's three pillars more holistically. These are important and positive developments. Nevertheless, due to the limited number of self-assessments submitted by countries for the final progress review, it is difficult to determine whether the System is fully in place in all ECE member States in Europe and Central Asia in line with all pillars and principles.

52. Full participation in the preparation of the report by all countries in the pan-European region was not achieved. Participation from European Union member States and countries of Central Asia remained moderate. Furthermore, not all countries in the Caucasus and Eastern Europe provided an assessment. Further steps to achieve wider participation for any future reviews beyond 2021 are therefore needed. These should include collaborative efforts, together with the European Environment Agency and UNEP, to identify mechanisms to motivate countries to continue digitalization of environmental data by using new technologies and to make the data fully available and accessible for the public also beyond the Ninth Environment for Europe Ministerial Conference. It is also important for countries to: participate in any future review of progress; report on all data flows associated with ECE environmental indicators; provide a complete picture; and strengthen the evidence base for informed decision-making.

53. The purpose of regular self-assessment is to encourage countries to implement measures that address gaps in the System's establishment over time. The assessment framework consequently provides a tool that allows countries to continue to monitor progress and identify needed resources and gaps to be closed.

54. Any future reviews should better assess how countries use the data in policymaking, monitoring progress towards policy targets and streamlining reporting processes.

55. The online reporting tool,[8] developed by UNEP in consultation with the Working Group and supported by ECE, was made available for the preparation of the present report, though difficulties were encountered in recovering data from the tool.

56. The present report is based on countries' self-assessments. The secretariat has only to a limited extent verified the information from the online tool. Inconsistencies in the information provided do, however, suggest a need for a validation mechanism. Any future reviews may consider this and other gaps identified.

IV. Further steps

57. The establishment of the Shared Environmental Information System is supported by several international capacity development mechanisms in the pan-European region, including the ECE Working Group on Environmental Monitoring and Assessment, the Joint Task Force on Environmental Statistics and Indicators and relevant projects being carried out by ECE, the European Environment Agency and UNEP. These activities are being implemented with financial support from donor countries, the European Union European Neighbourhood Instrument and the United Nations Development Account.

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[8] Available at https://wesr.unep.org/seis2.0/Login/index.

58. Furthermore, the European Environment Information and Observation Network has significantly complemented the establishment of the Shared Environmental Information System in member and cooperating countries of the European Environment Agency.

59. These initiatives and projects provide valuable support for the establishment of environmental information systems, for the production and use of ECE environmental indicators and to environmental monitoring and assessment overall in a harmonized and integrated manner.

60. The gaps identified by the self-assessments indicate that countries still need assistance to fully implement the Shared Environmental Information System's pillars and principles and for the full production and sharing of all data flows associated with the ECE environmental indicators also beyond 2021.

61. Further reviews of the implementation of the Shared Environmental Information System according to its principles would help to address gaps and, by doing so, ensure that it supports regular assessments and reporting in the region beyond 2021.

62. It is recommended that the establishment of the System and the production of relevant data flows that underpin the ECE environmental indicators be harmonized and aligned with the revised ECE environmental indicators when finalized. The ECE environmental indicators are being revised by the Joint Task Force and aligned with the Framework for the Development of Environmental Statistics and monitoring and assessment processes at the regional and global levels, including in the context of the 2030 Agenda and a green and circular economy, to enhance their policy relevance. Furthermore, it is recommended to continue digitalization of environmental monitoring systems and to use new technologies for enhanced high-quality data production.

63. The expected timeline for finalization of the final progress review report of the Shared Environmental Information System is as follows:

(a) May 2021: the Working Group discusses the final progress review report, as necessary, and approves it;

(b) November 2021: the Committee on Environmental Policy considers the final progress report on the establishment of the Shared Environmental Information System in Europe and Central Asia;

(c) October 2022: Ministers consider the final review report at the Ninth Environment for Europe Ministerial Conference.

V. Fact sheets on key findings and messages

64. Table 3 below lists the ECE member States in Europe and Central Asia and whether and by what means they have reported their self-assessments. Table 4 below indicates which themes reporting countries have covered.

65. Regular reporting on the state of the environment in the pan-European region countries provides comprehensive and targeted information about environmental conditions, trends and pressures in each country. The resulting reports provide a strategic view to shape policy and action. National state-of-the-environment reports, based on a sound evidence base, aim to inform and provide knowledge for decision-makers and the public and to engage readers to influence their behaviour.

66. Most pan-European region countries review the state of the environment regularly and prepare integrated reports covering several thematic areas and/or indicator-based national state-of-the-environment reports.

67. Within the framework of the final review of the establishment of a Shared Environmental Information System in Europe and Central Asia, ECE member States in the pan-European region were asked to provide information on the regularity and type of reports they produce. The reports vary in regularity, content and form but all of them support the transition to a more sustainable use of natural resources and the protection of the environment for the well-being of human life. Table 5 below provides an overview of whether national

state-of-the-environment reports or indicator-based state-of-the-environment reports are produced regularly. The table includes data extracted from the submitted self-assessments and was complemented by additional research for countries that did not submit a self-assessment.

Table 3
Overview of self-assessment submissions by country

Country	Format of submitted report: online and/or spreadsheet, or none
Albania	Online
Andorra	None
Armenia	None
Austria	Online, spreadsheet
Azerbaijan	Online
Belarus	Online, spreadsheet
Belgium	None
Bosnia and Herzegovina	Online
Bulgaria	Online
Croatia	Spreadsheet
Cyprus	None
Czechia	None
Denmark	None
Estonia	None
Finland	None
France	Online
Georgia	Online
Germany	Online
Greece	None
Hungary	None
Iceland	None
Ireland	None
Italy	None
Kazakhstan	Online, spreadsheet
Kyrgyzstan	None
Latvia	None
Liechtenstein	None
Lithuania	None
Luxembourg	None

Country	Format of submitted report: online and/or spreadsheet, or none
Malta	None
Monaco	None
Montenegro	Online, spreadsheet
Netherlands	None
Norway	None
North Macedonia	Online
Poland	None
Portugal	None
Rep. of Moldova	Online
Romania	Online
Russian Federation	None
San Marino	None
Serbia	Online
Slovakia	Online
Slovenia	None
Spain	Spreadsheet
Sweden	Online
Switzerland	Spreadsheet
Tajikistan	None
Türkiye	None
Turkmenistan	None
Ukraine	None
United Kingdom	None
Uzbekistan	Spreadsheet

Table 4
Overview of whether thematic level questions were answered by countries
(Yes or no)

Countries	Environmental theme								
	Agriculture	Air pollution and ozone depletion	Biodiversity	Climate change	Energy	Land and soil	Transport	Waste	Water
Albania*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Austria	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Azerbaijan*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Belarus	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bosnia and Herzegovina	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bulgaria*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Croatia*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
France	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Georgia	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Germany*	Yes	No	No	Yes	Yes	Yes	No	Yes	Yes
Kazakhstan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Montenegro*	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes
North Macedonia	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rep. of Moldova	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Romania	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Serbia*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Slovakia*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Spain*	No	Yes	Yes	Yes	No	No	No	Yes	Yes
Sweden*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Countries	Environmental theme								
	Agriculture	Air pollution and ozone depletion	Biodiversity	Climate change	Energy	Land and soil	Transport	Waste	Water
Switzerland	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Uzbekistan*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

* Thematic questions answered only in part

Table 5
Overview of national state-of-the-environment reporting

Country	Regular production of an integrated state-of-the-environment report	Year of latest state-of-the-environment report	Regular production of an indicator-based state-of-the-environment report	Year of latest indicator-based state-of-the-environment report
Albania	Yes	2019	No	2018
Andorra	TBC	TBC	Yes	2019
Armenia	No	2011	Yes	2020
Austria	Yes	2019	Yes	2019
Azerbaijan	No	2019	No	TBC
Belarus	Yes	2019	Yes	2019
Belgium (regions)	Yes	2019	No	2012
Bosnia and Herzegovina	Yes	2012	No	TBC
Bulgaria	Yes	2020	No	2020
Croatia	No	TBC	Yes	2019
Cyprus	No	2015	No	TBC
Czechia	Yes	2018	Yes	2020
Denmark	Yes	2014	Yes	TBC
Estonia	Yes	2013	Yes	2019
Finland	Yes	2018	Yes	2020
France	Yes	2019	Yes	2020
Georgia	Yes	2017	Yes	2017
Germany	Yes	2019	Yes	2020
Greece	Yes	2019	Yes	TBC
Hungary	Yes	2017	Yes	2020
Iceland	Yes	2019	Yes	2019
Ireland	Yes	2020	Yes	2020
Israel	Yes	2019	TBC	2010
Italy	Yes	2019	Yes	2019
Kazakhstan	Yes	2019	Yes	2018
Kyrgyzstan	No	2012	TBC	TBC
Latvia	Yes	2016	Yes	2019
Liechtenstein	No	2021	Yes	2015
Lithuania	Yes	2020	Yes	2020
Luxembourg	No	2003	TBC	2018

Country	Regular production of an integrated state-of-the-environment report	Year of latest state-of-the-environment report	Regular production of an indicator-based state-of-the-environment report	Year of latest indicator-based state-of-the-environment report
Malta	Yes	2018	Yes	2011
Monaco	Yes	2018	Yes	2018
Montenegro	Yes	2019	Yes	2017
Netherlands	Yes	2020	Yes	2019
North Macedonia	Yes	2020	Yes	2018
Norway	Yes	2020	Yes	2020
Poland	Yes	2018	No	2001
Portugal	Yes	2019	Yes	2011
Rep. of Moldova	Yes	2011	No	2014
Romania	Yes	2019	Yes	2018
Russian Federation	Yes	2019	Yes	2019
San Marino	TBC	TBC	Yes	2020
Serbia	Yes	2019	No	2016
Slovakia	Yes	2018	Yes	2020
Slovenia	No	2010	Yes	2020
Spain	Yes	2019	Yes	2019
Sweden	Yes	2020	Yes	2020
Switzerland	Yes	2018	Yes	2018
Tajikistan	No	TBC	TBC	TBC
Türkiye	Yes	2016	Yes	2017
Turkmenistan	No	TBC	No	TBC
Ukraine	Yes	2015	No	TBC
United Kingdom	Yes	2020	Yes	TBC
Uzbekistan	No	TBC	No	TBC

Source: Self-assessment reports by countries, European Environment Agency and national websites.

Abbreviations: TBC, to be confirmed.

A.   Relevance

68.   In the category of "relevance", countries were invited to specify, for each data flow, whether it was used for more than one purpose, such as for the production of national indicators and in order to meet reporting obligations, with the option of replying "yes", or "no". The results from the 21 submissions are shown in figure I below. For the mid-term review report, the default response provided by the European Environment Agency for its member countries and cooperating countries was "yes" for all seven data flows. This is most likely also still the case for the other data flows not part of the 2018 assessment. The final progress review revealed that data flows were used for multiple purposes in 80 per cent of cases by the 21 countries that reported – a lower performance than in 2018. This is, however, probably due to the increased number of data flows and the fact that many European Environment Agency member countries did not provide a self-assessment and could not be considered.

69.   Similarly, to the mid-term review, countries were asked to provide examples of multipurpose use of data flows. The replies included combinations of the following:

        (a)   Reporting under European Union directives, ECE multilateral environmental agreements and for other national/international reporting purposes;

        (b)   National/international reporting, including air pollutant emission inventory reporting or greenhouse gas inventory reporting;

        (c)   Provision of data for production of environmental indicators and statistics;

        (d)   Inputs to European Environment Agency reports, Eurostat reports and for Sustainable Development Goal reports;

        (e)   Production of national state-of-the-environment reports and thematic bulletins;

        (f)   Production of technical reports and studies;

        (g)   National-level policymaking;

        (h)   Public information.

B.   Accessibility

70.   In the category of "accessibility", countries were invited to specify, for each data set, whether it was readily available and accessible online for users on a national platform, with the option of replying either "yes" or "no". The results from the 21 submissions are shown in figure II below. For the final progress review report, data flows were readily available and accessible online in 72 per cent of cases, which is lower than in 2018. This is probably due to the fact that many countries did not submit a report and were therefore not considered.

71.   The default response provided by the European Environment Agency in 2018 was "yes" for all data flows, which is likely still the case (see also para. 44 above) and would thus result in a higher percentage rate for the whole region.

C.   Comparability

72.   Within the category of "comparability", and based on the countries' replies, for each data flow, limitations in comparing the data flow across countries and the region were assessed with the option of replying "yes", or "no". The results from the submissions are shown in figure III below. Limitations were identified in 44 per cent of cases due also to the fact that several countries did not provide links to the data flows or information on the time series. The default response provided by the European Environment Agency in 2018 was "yes" for all seven data flows.

Figure I
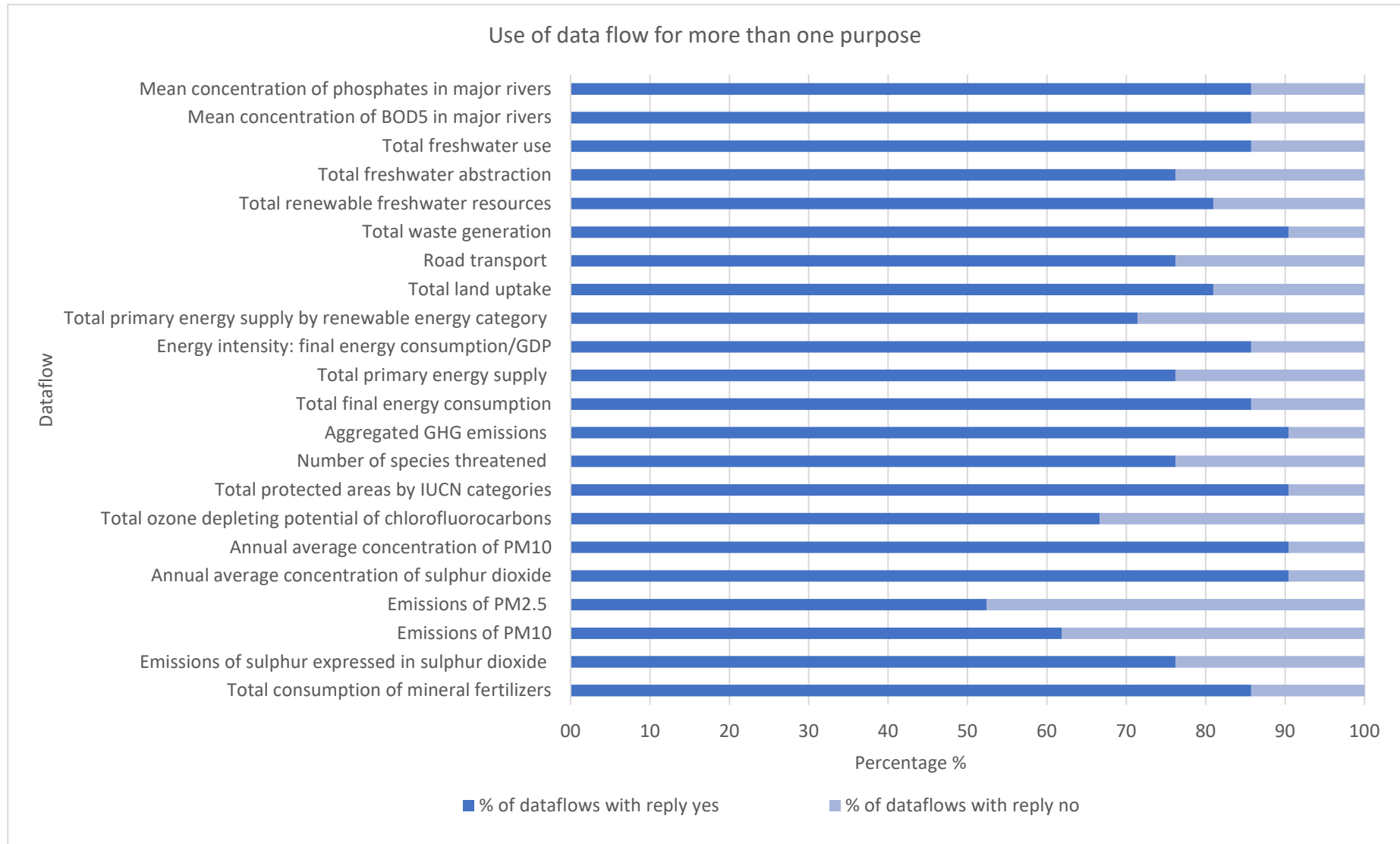**Use of data flows for more than one purpose**

Use of data flow for more than one purpose

■ % of dataflows with reply yes   ■ % of dataflows with reply no

Figure II
Ready online availability and accessibility of data flows on a national platform

Data flow readily available and accessible

(Horizontal bar chart, X-axis: Percentage %, from 00 to 100; Y-axis: Dataflow)

Categories (top to bottom):
- Mean concentration of phosphates in major rivers
- Mean concentration of BOD5 in major rivers
- Total freshwater use
- Total freshwater abstraction
- Total renewable freshwater resources
- Total waste generation
- Road transport
- Total land uptake
- Total primary energy supply by renewable energy category
- Energy intensity
- Total primary energy supply
- Total final energy consumption
- Aggregated GHG emissions
- Number of species threatened
- Total protected areas by IUCN categories
- Total ozone depleting potential of chlorofluorocarbons
- Annual average concentration of PM10
- Annual average concentration of sulphur dioxide
- Emissions of PM2.5
- Emissions of PM10
- Emissions of sulphur expressed in sulphur dioxide
- Total consumption of mineral fertilizers

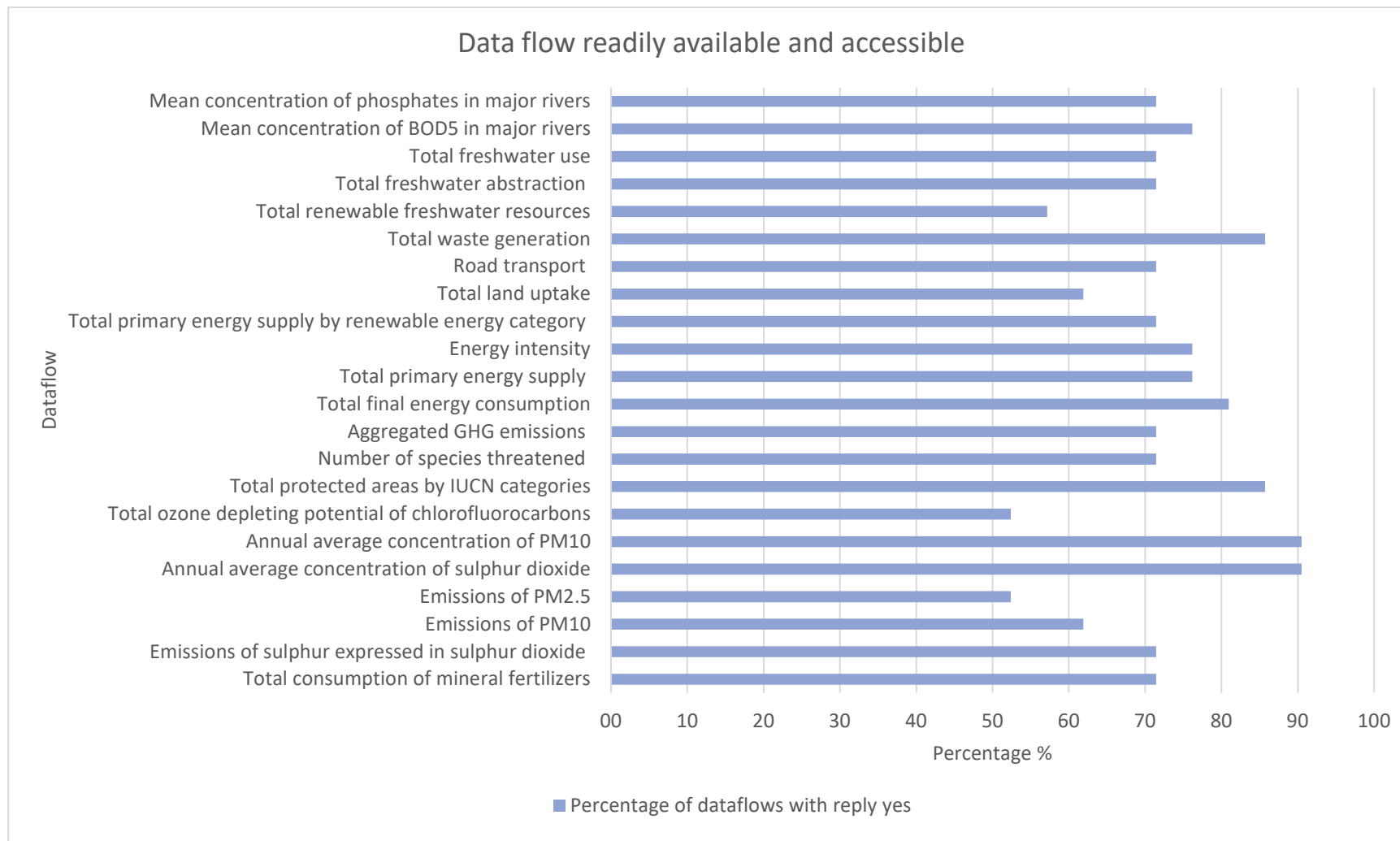■ Percentage of dataflows with reply yes

Figure III
Limitations in comparing the data flow across countries in the pan-European region

Limitations in comparing data flows