

Sharing and dissemination of environmental information

Country maturity report: Ukraine

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This report was produced by PricewaterhouseCoopers as part of the project for developing a roadmap and identify feasible and practical means for integrating environmental information in national e-governance/open data processes and platforms. This action is done in the context of the ENI SEIS II East project 2016-2020. The report was built in 2018 and updated throughout 2019, including a review in March 2019 after the first regional meeting in Kiev, and a second review after the roundtable in November 2019. The report was reviewed by public authorities in Ukraine in January 2020.

This report contains information obtained or derived from a variety of publicly available sources described within the report in more detail and does not intend to be a comprehensive analysis of environmental information, open data and e-government in the country but a collection of the main elements shaping the national environmental information landscape.



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List of abbreviations

Abbreviation	Definition
CC BY 4.0	Creative Commons Attribution 4.0 International License
CKAN	Comprehensive Knowledge Archive Network
CMU	Cabinet of Ministers of Ukraine
DCAT-AP	Data Catalogue Vocabulary - Application Profile
DKAN	Drupal-based open data portal based on CKAN
EaP	Eastern Partnership
EEA	European Environment Agency
EGDI	E-Government Development Index
EIA	Environmental Impact Assessment
EITI	Extractive Industries Transparency Initiative
ENI	European Neighbourhood Instrument
EPI	Environmental Performance Index
EU	European Union
HCI	Human Capital Index
IAC	Information Analytical Centre
ICT	Information Communication Technologies
MEA	Multilateral Environmental Agreement
MENR	Ministry of Environment and Natural Resources
NFP	National Focal Point
NGO	Non-Government organisation
NSDI	National Spatial Data Infrastructure
ODIN	Open Data Inventory
OGP	Open Government Partnership
OSA	Oblast State Administrations
OSI	Online Service Index
PRTR	Pollutant Release and Transfer Register
SEI	State Ecological Inspectorate of Ukraine
SEIS	Shared Environmental Information System
SEMS	State Environment Monitoring System
TII	Telecommunication Infrastructure Index
UNECE	United Nations Economic Commission for Europe
USAID	United States Agency for International Development



1 Methodological approach and policy context

The methodology followed to prepare this report is based on the 2018 and 2019 European Union reports *Open data maturity in Europe*, with some adjustments made to accommodate the specific situation of Eastern Partnership countries as well as the focus on environmental information.

This report was produced by PricewaterhouseCoopers as part of the European Environment Agency (EEA) service contract No. 3437/R0-ENIE/EEA.57335 for developing a roadmap and identify feasible and practical means for integrating environmental information in national e-governance/open data processes and platforms. This action is done in the context of the EU-funded ENI SEIS II East project 2016-2020, which targets Armenia, Azerbaijan, Belarus, Georgia, the Republic of Moldova and, Ukraine – namely Eastern Partnership countries (EaP).

In all countries of the Eastern Partnership, e-governance and open data initiatives are recognised as mainstream for making data and information easily accessible to the policymakers, public and other stakeholders. Sharing environmental information through national e-governance and open data frameworks based on the Shared Environmental Information System (SEIS) principles¹ has seen an important development in recent years. Nonetheless, it could be further underpinned with clearly developed visions and comprehensive roadmaps for this specific area. The benefits of sharing, disseminating and promoting reuse of environmental information can support the governmental policies and actions in environment and related areas, the transition towards a green economy, innovations, compliance with various reporting obligations as well as the implementation of various sustainable development goals (SDGs). Furthermore, it can streamline efforts and reduce the reporting burden for the national bodies by working together in a more structured and connected way. The present project aims to facilitate such exchanges and helping the EaP countries advance in developing an open data policy for the environment. The project takes places in the context of several international commitments and strategic documents related to the collection, update, sharing, dissemination and use of environmental information as follows:

- Article 5 of the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention) and decision VI/1 of the Meeting of the Parties to the Aarhus Convention on promoting effective access to information²;
- The Protocol on Pollutant Release and Transfer Registers (Protocol on PRTRs)³;

¹ <https://www.eea.europa.eu/about-us/what/shared-environmental-information-system-1/shared-environmental-information-system>

² <https://www.unece.org/env/pp/treatytext.html>

³ <https://www.unece.org/env/pp/prtr/docs/prtrtext.html>



- The Batumi Declaration “Greener, cleaner, smarter!”⁴ adopted by Ministers of the UNECE region calling to have SEIS in place in support to regular assessment in countries of UNECE region by 2021;
- The Declaration on Cooperation on Environment and Climate Change in Eastern Partnership⁵ (Luxembourg 2016);
- The 2030 Agenda for Sustainable Development⁶;
- The European Green Deal (2019)⁷;
- ‘Eastern Partnership policy beyond 2020’ Communication⁸ adopted on 18 March 2020;

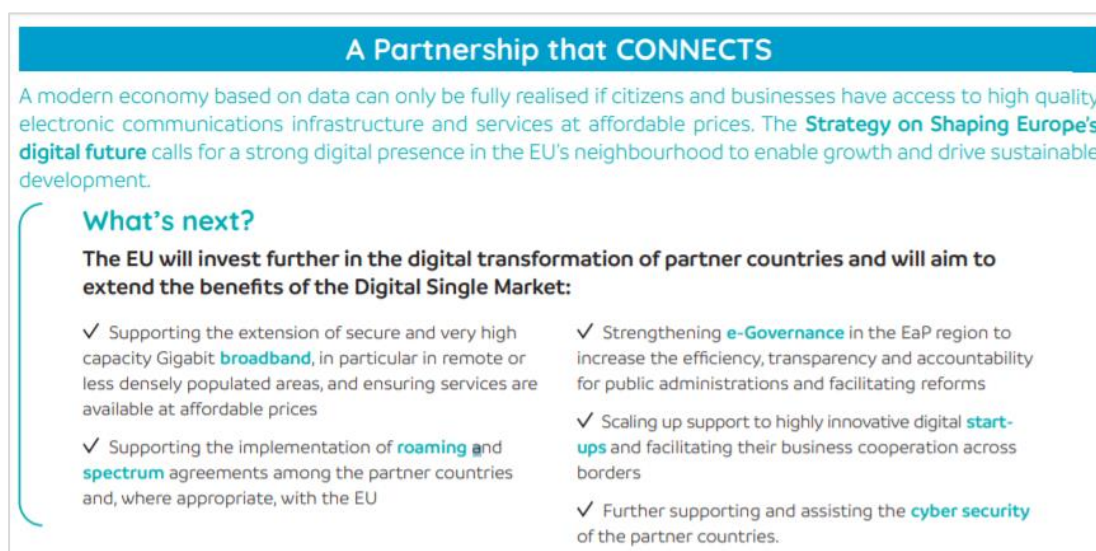


Figure 1. One of the five objectives of Eastern Partnership policy initiative (2020, Factsheet: The Eastern Partnership beyond 2020: Reinforcing Resilience – a partnership that delivers for all⁹)

- UN Secretary-General's Roadmap for Digital Cooperation¹⁰;
- Eastern Partnership leaders' video conference, 18 June 2020¹¹.

SEIS also underpins the Good Environmental Governance flagship initiative of the EU. EEA is currently supporting this process in both the European Neighbourhood countries¹² East¹³ and South¹⁴ in the context of dedicated projects currently running until mid-2020.

⁴ <https://www.unece.org/fileadmin/DAM/env/documents/2016/ece/ece.batumi.conf.2016.2.add.1.e.pdf>

⁵

https://ec.europa.eu/environment/international_issues/pdf/declaration_on_cooperation_eastern_partnership.pdf

⁶ <https://sustainabledevelopment.un.org/post2015/transformingourworld>

⁷ https://ec.europa.eu/info/sites/info/files/european-green-deal-communication_en.pdf

⁸ <https://data.consilium.europa.eu/doc/document/ST-6930-2020-ADD-1-REV-1/en/pdf>

⁹ https://eeas.europa.eu/sites/eeas/files/eap_joint_communication_factsheet_18.03.en_.pdf

¹⁰ <https://www.un.org/en/content/digital-cooperation-roadmap/>

¹¹ <https://www.consilium.europa.eu/en/meetings/international-summit/2020/06/18/>

¹² <https://euneighbours.eu/en>

¹³ EU Neighbours East: Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova, and Ukraine



As part of this project, the “Country maturity report on sharing and dissemination of environmental information” has been prepared. The report reflects on the national e-government and maturity level of open data. The report identifies synergies for fostering environmental information sharing and dissemination to support the implementation, among others, of the SEIS principles, of the UNECE Aarhus Convention and Protocol on PRTRs. As such, the project aiming to 1) gradually expand the open data maturity approach to European Neighbourhood Instrument (ENI) countries and the specific topic of environment, 2) assess the ENI status of development in e-governance and open data for the environment, and 3) develop with the ENI countries a roadmap for fostering the process and gradually align it to similar developments taking place in European Union and other more advanced countries.

The report highlights the main challenges in the country in this area. The report serves as a tool to initiate the discussion about the strategic development and potential initiatives at the national level, bringing stakeholders from e-government, open data, and the environment together. It can serve both as a tool for further implementation and as a possible replicable prototype for other countries.

The SEIS approach consists of three pillars: Content, Infrastructure and Cooperation¹⁵, and this approach was followed for structuring the report and for gathering the necessary information. The report also leverages the work done in the European Union for measuring the maturity level of open data in the Member States. Consequently, the report adopts a similar structure as the “Open Data Maturity in Europe 2019”¹⁶ published on the European Open Data Portal but adapted to EaP countries and also focusing on the connection between e-government, open data and environmental information. As such, the report is built around three major blocks, namely 1) the assessment of environmental information readiness; 2) the assessment of technological enablers; and 3) the key challenges and their translation into a proposed roadmap. The structure of the report is similar for all EaP countries. This approach makes the analysis comparable across EaP countries and serves as a baseline for developing and exchanging initiatives across the region.

In this regard, all country reports are complemented by the Good practices report which supports the implementation of the proposed roadmaps offering possible solutions and alternatives based on the example of other countries and international organisations.

¹⁴ EU Neighbours South: Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestine, and Tunisia

¹⁵ <https://eni-seis.eionet.europa.eu/east/governance/what-is-seis>

¹⁶ The report structure was prepared according to Open Data Maturity in Europe 2018 and updated according to Open Data Maturity in Europe 2019
<https://www.europeandataportal.eu/en/dashboard#2019>



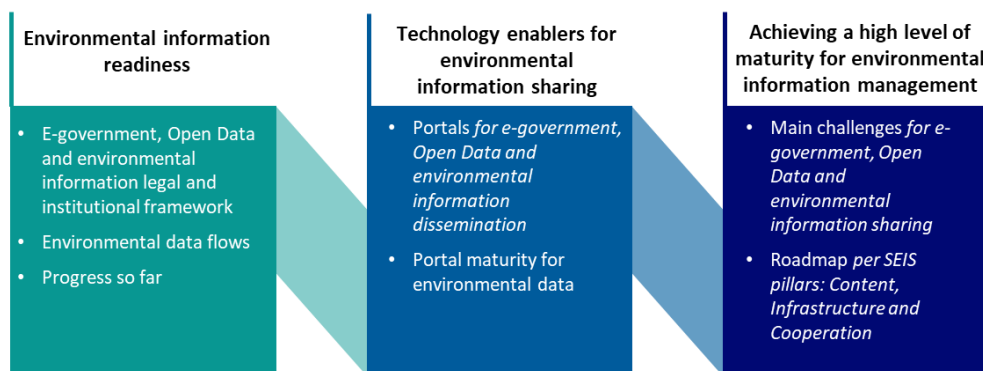


Figure 2. The country maturity report structure

The report was prepared in close cooperation with EEA project team, the National Focal Points (NFPs) for the ENI SEIS project, the UNECE Aarhus Convention and the Protocol on PRTRs Secretariat and NFPs respectively, and, the ENI SEIS national assistants. Furthermore, a broad consultation with local experts across a wide range of topics was ensured, ranging from environment, statistics, sectoral policies up to e-government and IT infrastructure.

The following sources of information were analysed to prepare the report, namely:

- **Legislation:**
 - Legal acts related to public information;
 - Legal acts related to open data;
 - Legal acts related to e-government;
 - Legal acts related to environmental information.
- **Environmental reporting:**
 - Aarhus Convention national implementation reports¹⁷;
 - Protocol on PRTRs national implementation reports, where available;
 - UNECE Environmental Performance Review, where available;
 - EU Analytical Report 7: Open Data in the European Union Neighbourhood¹⁸;
 - UNECE Progress in the production and sharing of core environmental indicators;
 - EEA – Ukraine country report under ENPI-SEIS¹⁹;
 - County Factsheets on the state of SEIS implementation in 2018²⁰;

¹⁷ 2017 National implementation reports by Parties:

https://www.unece.org/env/pp/reports_trc_implementation_2017.html

¹⁸ European Open Data Portal, Analytical Report 7, Open Data in the European Union Neighbourhood, June 2017, Capgemini, funded by the European Commission.

https://www.europeandataportal.eu/sites/default/files/edp_analytical_report_n7.pdf

¹⁹ ENPI-SEIS East Region Synthesis Report, European Environment Agency, 2010-2014

<https://www.eea.europa.eu/publications/enpi-seis-east-region-synthesis-report>



- World Bank -Country Environmental Analysis, where available;
- Country presentations made during the 4th ENI SEIS II East Project Steering Committee Meeting²¹, 12 November 2019 in Copenhagen;
- Other country-specific reports.
- Portals:
 - EU Open Data portal and national open data portals;
 - E-government services portals;
 - Environmental portals;
 - State Statistics Service official website.
- Other sources:
 - Country-specific reports and/or analysis prepared by national and international bodies.

The challenges identified in each country, the related good practices, and the initiatives stemming from the roadmap were discussed initially during the regional event in Kiev on 4-6 March 2019. Furthermore, the country maturity report was updated based on the discussions and presentations made at the national event in Kiev and was further discussed in the national roundtable, with a focus on the roadmap (way forward). The roundtable gathered over 30 stakeholders from various sectors, including e-government, open data and environmental information providers and users (including NFPs from the ENI SEIS project and the Aarhus Convention, few representatives from non-governmental organisations and Aarhus Centre). Comments, presentations and conclusions from the national discussions were integrated into the report.



²⁰ <http://www.unece.org/environmental-policy/environmental-monitoring-and-assessment/areas-of-work/shared-environmental-information-system.html>

²¹ Presentations are available here: <https://eni-seis.eionet.europa.eu/east/areas-of-work/communication/events/project-related-events/4th-eni-seis-ii-east-project-steering-committee-meeting>



Figure 3. Picture from the first regional meeting in Kiev – Credit: Nelli Baghdasaryan

The conclusions and recommendations from the roadmap were finally presented at the second regional UNECE-EEA workshop “Open Data for the Environment” that took place in Geneva, on 2 October 2019 back-to-back with the Aarhus Convention Task Force on Access to Information. Furthermore, the final draft version of the report was shared with the ENI countries, and the last consultation was organised in December 2019 before releasing the final version of the report.

All materials, including the summary of the discussions taking place in the events organised in the context of the project, are available at the links below:

- [1st Regional workshop on Open Data and e-Government for the Environment \(Kiev, 4-6 March 2019\)](#)
- [National roundtable on open data and e-government for the environment in Armenia](#)
- [National roundtable on open data and e-government for the environment in Azerbaijan](#)
- [National roundtable on open data and e-government for the environment in Belarus](#)
- [National roundtable on open data and e-government for the environment in Georgia](#)
- [National roundtable on open data and e-government for the environment in the Republic of Moldova](#)
- [National roundtable on open data and e-government for the environment in Ukraine](#)
- [Joint UNECE-EEA Workshop on Open Data for the Environment \(Geneva, 2 October 2019\)](#)



2 Executive summary

The methodology followed to prepare the present report is based on the 2018 and 2019 European Union report on open data maturity in Europe. Some adjustments were made to accommodate the specific situation of Eastern Partnership countries as well as the focus on environmental information.

The report was prepared and updated between 2018 and 2020 as part of the EU-funded project implemented by EEA- 'Implementation of the Shared Environmental Information System principles and practices in the Eastern Partnership countries' (ENI SEIS II East). The national input in the preparation of the report was ensured through broad dialogue and consultation with various institutions in Ukraine, in particular those related to the environment and statistics. In addition, experts across various policy domains, including IT and e-government, have been involved through participation in national and regional events. These activities allowed for the exchange of views on the future of the e-government and open data in the cross-cutting domain of the environment in Ukraine. As a result, the document presents an overview of the national e-government framework, the maturity level of open data and dissemination of environmental information in Ukraine. The analysis included the following:

- the policy framework was reviewed to identify existing strategic directions and available tools for the dissemination of environmental information using open data and e-government solutions;
- the legal framework was reviewed to determine the requirements related to e-government, open data, and dissemination of environmental data and information;
- technological solutions were assessed to determine the existing technical capabilities and improvements needed in the future.

Based on the above, the document proposes a roadmap that includes measures focusing on the development of e-government and open data frameworks, which would greatly support the environmental domain and even beyond. The road map is intended to be a living document throughout the implementation process and serve as a benchmark in assessing progress at various stages of development.

E-government

Ukraine has adopted several legal acts to strengthen its e-government legal framework. The Digital Agenda for Ukraine was adopted in 2018, stating the main goals up to 2020. Its main pillars are based on the EU Digital Strategy and EU Digital Single Market Strategy, and they include: information and communication technology (ICT) infrastructure, digital skills, e-market, digital governance, innovations and R&D, trust and cybersecurity, and benefits from ICT for society and the economy. As the strategic objectives were planned up to 2020, there is an urgent need to evaluate the progress achieved in the area of e-government and, based on existing objectives, introduce an action plan to be implemented from 2021 onwards.

Ukraine could benefit from formalising the interoperability framework by regulating responsibilities, procedures and standards for data exchange at the national level. However,



some tools for data exchange are already in place and used by governmental institutions. For example, in 2019 Ukraine developed and introduced the “Trembita” data exchange system for state electronic information resources. The system enables data exchange between government information systems. It is recommended to use “Trembita” for environmental data and information exchange.

Open data

In recent years, Ukraine has developed legislation that supports public access to information and open data. However, legislation covering the procedures for open data preparation, update, quality control and dissemination are still to be developed.

There are around 30 000 datasets available on the Open Data Portal of Ukraine, which puts Ukraine in a leading position among ENI countries and the top 10 countries in Europe²². The Open Data Portal is automatically harvested by the European Data Portal. However, the quality of open data sets should be further improved to provide valuable and reusable data. In addition, only about 40 per cent of datasets are available in machine-readable formats.

In Ukraine open data initiatives are supported also by non-governmental organisations (NGOs) – for example, the Open Data Portal was developed as a result of close cooperation between PO SocialBoost and the Government of Ukraine.

Environmental information sharing and dissemination

Ukraine’s environmental legislation consists of more than 300 acts that cover a broad area of environmental protection and natural resource management. However, the overall legislative framework could benefit from better alignment and a more coordinated approach.

The institutional framework has changed rather often as the responsibility for state policy in the field of environment has shifted between institutions. The changes planned in the nearest future in the government organisational structure in the environmental domain represent both a challenge and also an opportunity to better assign and clarify responsibilities in the area of environmental data management and dissemination.

Ukraine has developed multiple environmental information management portals. Currently, the ambitious Open Environment portal is being developed. It is intended as a national, automated, informational-analytical system in the field of environmental protection, rational use and protection of natural resources. In addition, there are plans to provide a single and free point of access to environmental information in Ukraine.

²² <https://www.europeandataportal.eu/data/datasets>



Suggested recommendations

Following the analysis of the current situation, a proposed roadmap outlines key areas for future development in the field of e-government, open data and dissemination of environmental information and provides concrete measures for improvement. Furthermore, in order to facilitate the implementation of the roadmap, a number of examples and practical recommendations are additionally provided and summarised in the report “Open data and e-government good practices for fostering environmental information sharing and dissemination”.

The success and rapid advancement of the country in this challenging domain remain strongly dependent on clear priority-setting, multidisciplinary teamwork and regular monitoring of progress. Furthermore, once progress is made in one or several areas proposed for consideration, readjustments and amendments of the roadmap will be needed to keep it relevant and focus on the key priorities for the country.

The measures recommended for Ukraine in the context of the roadmap are grouped into the following categories: policy-related, legal and technical measures. These cover, in particular, the following issues:

- Policy measures refer to, *inter alia*, the update of Digital Agenda for Ukraine and open data policy, and supporting practical arrangements for open data collection, update, quality assurance/quality control and dissemination.
- Legal measures refer to, *inter alia*, clear definition of responsibilities for public authorities in the area of the environmental data management and dissemination. In addition, the need to develop specific legal acts concerning interoperability and metadata description to be compatible with international standards;
- Technical measures refer to, *inter alia*, the development of an integrated information system and a single access point for environmental information, updating licencing terms and conditions, preparation of metadata description and enhancing the multilingual aspect of web portals and websites in the area of the environment.

All of the measures need to be seen as strongly interacting with and interdependent of each other and the impact of their gradual implementation closely monitored, as it may bring systemic changes across the whole data and information chain.

To address these measures a multidisciplinary team should be set up to address and oversee the implementation of all the above-presented measures.

A specific recommendation for Ukraine is to improve data quality aspect. In practice this recommendation could be achieved by implementing relevant actions set out in the roadmap and summarised below:

- Specific policy measures refer primarily to implementing procedures and practical tools to ensure data quality control at organisational and national levels;
- Specific legal measures could look into regulating organisational responsibilities and obligations of institutions with regards to data quality;



- Specific technical measures could address the development of software solutions to enhance data quality also.

The present report depicts the current status of e-government, open data and environmental information management and dissemination in Ukraine. Given the exponential development of this area and its recognition as a top policy priority for the near future a regular update and analysis of the situation is strongly recommended.



3 The readiness of environmental information

3.1 E-government, open data and environmental information – legal and institutional framework

This section contains a summary of the national legal acts, policy and institutional frameworks related or relevant to e-government, open data and environmental information.

3.1.1 National policy and legal framework

3.1.1.1 E-government

This section presents the main laws and policies shaping the e-government landscape in Ukraine.

Law on National Programme of Informatisation²³

This law defines the general principles of development, implementation and adjustment of the National Informatisation Programme. It represents the complexity of the interconnected separate tasks (projects) of informatisation directed to the realisation of state policy and the priority directions of development of the modern information infrastructure of Ukraine. The programme defines the procedure for assigning financial funds for programmes and projects of informatisation.

Law on Electronic Documents and Electronic Documents Flow²⁴

This law establishes the main organisational and legal basis for the electronic management and use of documents. It describes the process of creating, sending, transmitting, receiving, storing, processing, using and destroying electronic documents. This law is linked with the use of e-signatures as defined in the Law of Ukraine on Electronic Trust Services²⁵.

Law on Administrative Services²⁶

This law establishes the legal rights, freedoms and legitimate interests of public and legal entities in the field of administrative services. It provides the standard description for administrative services. The law states that provision of administrative services in electronic form and access for subjects of access to information on administrative services using the

²³ <https://zakon.rada.gov.ua/laws/show/74/98-ep>

²⁴ <https://zakon.rada.gov.ua/laws/show/851-15>

²⁵ <https://zakon.rada.gov.ua/laws/show/2155-19>

²⁶ <https://zakon.rada.gov.ua/laws/show/5203-17>



internet is provided through the Unified State Portal of Administrative Services²⁷, which is the official source of information on the provision of administrative services in Ukraine.

Digital Agenda for Ukraine – 2020²⁸

The Digital Agenda was adopted in 2018. This document outlines the principles for development in the digital space and the basis for the development of the digital economy in the country.

The main pillars of the Digital Agenda for Ukraine are:

- *Telecommunications and information and communication technology (ICT) infrastructure*, focusing on the development of broadband and cloud infrastructure as well as the alignment the laws and regulations with EU legislation;
- *Digital skills*, focusing on the implementation of a re-education programme, the establishment of an open digital university, the digitalisation of schools, the development of pilot smart living projects and the popularisation of “e-style”;
- *E-market*, focusing on intellectual property rights, the development of e-commerce and data protection;
- *Digital governance*, focusing on the development of state authorities’ e-services and the improvement of the efficiency of state governance;
- *Innovation, research and development (R&D)*, focusing on improving the business climate for R&D, creating a science hub, encouraging joint ventures financing this activity and ensuring the enforcement of intellectual property rights;
- *Trust and cybersecurity*, focusing on developing national cybersecurity, ensuring network and information security, increasing awareness and online safety;
- *Benefits of ICT for society and economy*, focusing on developing a smart city, implementing e-health solutions and setting safeguards online to ensure cybersecurity.

3.1.1.2 Open Data

This section presents the main laws and policies shaping the open data initiative in Ukraine.

Law on Information²⁹

This law provides the right to access information for anyone living in Ukraine. It sets forth the legal principles of activities in the information sphere, and governs the relations concerning creation, collection, access, storage, use, dissemination and protection of information. It also defines the types of information, e.g. statistical information and environmental information. It states that the information on the environment, except the information about the location of military facilities, may not be classified as information with limited access.

²⁷ <https://my.gov.ua/>

²⁸ http://www.e-ukraine.org.ua/media/Lviv_Minich_2.pdf

²⁹ <https://zakon.rada.gov.ua/laws/show/2657-12>



Law on Public Access to Information³⁰

This law defines the right of the public access to information. The purpose of this law is to ensure transparency and openness of public authorities' work and to develop mechanisms for ensuring the right of the public to access information maintained by government institutions.

In April 2015, the Government of Ukraine took additional steps to increase transparency by granting free access to public information online in the form of open data, by adopting the Law on Amendments to Some Laws of Ukraine on Access to Public Information in the form of Open Data³¹ and the Law on Access to Information on Budget Figures in the form of Open Data³². These laws are expected to push government agencies to publish operational data, statistics and reports upon request. Data will have to be updated regularly and published on government websites and the National Open Data Portal. However, additional regulation is needed in order to specify the types of data that will be made publicly available.

In October 2015, the Ukrainian parliament passed amendments to the Law on Public Access to Information, aiming to simplify access to public data with a focus on open data. To support the amendments, the Cabinet of Ministers of Ukraine (CMU) adopted a resolution on the approval of regulations on datasets to be published in the form of open data³³, which contains a list of more than 300 datasets to be opened, specifying the responsible bodies. As of December 2017, 93% of these datasets had been published³⁴. The list includes several datasets related to the environment from institutions such as the Ministry of Health, the Ministry of Environment and Natural Resources, the State Service of Geology and Subsoil, the State Water Resources Agency, the Ministry of Economic Development, Trade and Agriculture, the State Forest Resources Agency, the State Fisheries Agency, the State Service of Geodesy, Cartography and Cadastre and State Statistics Service of Ukraine. Currently, there are no official decisions that specify the data that should be open further.

Resolution of the Cabinet of Ministers of Ukraine No. 357 of 10 May 2018 on "Some questions of the organisation of electronic interaction of the state electronic information resources"³⁵

In May 2018, the Cabinet of Ministers issued a resolution on the organisation of digital exchange between various government information resources. The regulation specifies how the exchange of data is organised between high-priority registers, e.g. agreement templates and data exchange formats.

³⁰ <https://zakon.rada.gov.ua/laws/show/2939-17>

³¹ <https://zakon.rada.gov.ua/laws/show/319-19>

³² <https://zakon.rada.gov.ua/laws/show/313-19>

³³ <https://zakon.rada.gov.ua/laws/show/835-2015-%D0%BF>

³⁴ Economic potential of open, data for Ukraine, 2018, Kiev School of Economics, <http://tapas.org.ua/en/all/news/economic-potential-of-open-data-for-ukraine-the-results-of-the-research/>

³⁵ <https://zakon.rada.gov.ua/laws/show/357-2018-%D0%BF>



The resolution applies to all governmental electronic information resources containing environmental information. Currently, state entities can use data from governmental electronic information resources listed in the National Register of Electronic Information Resources³⁶. This information is available only in the Ukrainian language. In practice, the repository was not accessible during the preparation of this report.

3.1.1.3 Environmental information

Ukrainian environmental legislation counts more than 300 laws and covers most areas of environmental protection and natural resource management.

In 2017, the study “Implementation of environmental commitments in the context of deregulation in the European Union: the experience of best practices from Ukraine, analytical paper from the Resource and Analysis Centre ‘Society and Environment’”³⁷ identified the need to improve the level of implementation of environmental legislation. The main challenges identified in the report referred to the following:

- the environmental legislation is largely declarative without specifying the implementation or enforcement mechanisms behind them;
- preparation of many legal acts lacks a coordinated approach at the institutional level.

The following section presents the main laws and policies shaping the legal environmental information landscape in Ukraine.

Law on Environmental Protection³⁸

This law defines the legal, economic and social dimensions of environmental protection. The law, in particular Articles 20 and 22, provides the basis for the establishment of the State Environment Monitoring System (SEMS) and the monitoring of the state of the environment. These functions are currently entrusted to the Ministry of Environment and Natural Resources and other government institutions, which are the subjects of the state environment monitoring system.

Law on Environmental Impact Assessment³⁹

This law establishes the legal and organisational framework for Environmental Impact Assessment (EIA). The framework aims to prevent environmental damage, ensure environmental protection, rationalise use of natural resources and enable supervision of economic activities that may have a significant impact on the environment taking into account public and private interests. The law has also established an EIA register, an important online tool for access to environmental information related to specific planned activities.

³⁶ <https://e-resurs.gov.ua/>

³⁷ <http://www.rac.org.ua/vydannya/analitychni-dokumenty/implementatsiya-ekologichnykh-zobovyzan-v-umovakh-deregulyatsiyi-v-evropeyskomu-soyuzi-dosvid-kraschykh-praktyk-dlya-ukrayiny-analitychnyy-dokument-2017>

³⁸ <https://zakon.rada.gov.ua/laws/show/1264-12>

³⁹ <https://zakon.rada.gov.ua/laws/show/2059-19>



Law on Strategic Environmental Assessment⁴⁰

This law defines the scope of the Strategic Environmental Assessment (SEA), establishes the procedure for its implementation and cross-border consultations. In general, the law has a similar approach to EU Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (SEA Directive). This law defines the organisational setup and cooperation procedures between different state institutions in the field of SEA.

Law on National Infrastructure of Geospatial Data⁴¹

This law establishes the general legal basis for the establishment and development of the national geospatial infrastructure to support effective decision-making by state and local government bodies. It defines the targets for national geospatial infrastructure, which should support the needs of society for all types of geographical information, as well as integration into global and European geospatial infrastructure data. The law foresees meeting the technical requirements set by the INSPIRE directive⁴².

Resolution of the Cabinet of Ministers No. 391 of 30 March 1998 on the State Environment Monitoring System (SEMS) and the procedures and regulations of the state monitoring of individual components of the environment⁴³

This resolution refers to the collaboration between different stakeholders regarding environmental information monitoring. The main tasks of the entities in charge of the monitoring system include:

- long-term systematic environmental monitoring;
- analysis of the state of the environment and forecasting of potential changes;
- supporting the decision-making process in the areas of environmental protection, sustainable use of natural resources and environmental safety;
- providing information on the state of the environment to public authorities, local government, as well as to the public and international organisations.

The resolution also states that environmental monitoring is carried out by:

- the Ministry of Environment and Natural Resources;
- the State Water Resources Agency;
- the State Service for Geodesy and Subsoil;
- the State Emergency Service of Ukraine;
- the Ministry of Health;
- the Ministry of Communities and Territorial Development;
- the Ministry of Economic Development, Trade and Agriculture;

⁴⁰ <https://zakon.rada.gov.ua/laws/show/2354-19>

⁴¹ <https://zakon.rada.gov.ua/laws/show/554-20>

⁴² Directive 2007/2 European Parliament and of the Council of 14 March 2007 requested information on Spatial Information Infrastructure in the European Union

⁴³ <https://zakon.rada.gov.ua/laws/main/391-98-n>



- the State Forest Resources Agency;
- the State Service of Geodesy, Cartography and Cadastre.

Law on State Statistics⁴⁴

The law regulates the main tasks of bodies responsible for state statistics, namely:

- ensuring accessibility, transparency and openness to statistical information, its sources and methodology of compilation;
- providing regular access to statistical information (including statistical information in the area of the environment) for legal entities and individuals;
- providing statistics to international organisations as well as exchanging statistical information with similar organisations of other countries as required by Ukrainian legislation.

This law regulates, among others, the following aspects:

- the procedure and conditions to accessing statistical information;
- international cooperation in the field of statistics – directed at informational cooperation on statistical methodology and practice, as well as on the exchange of information and experience with international statistical organisations of other countries;
- criteria for data received from respondents by the state statistics bodies within the state statistical surveys, observations on the environment are considered to be open data.

Orders of the Ministry of Environment and Natural Resources related to environmental monitoring⁴⁵

The orders of the Ministry of Environment and Natural Resources that shape the landscape of environmental monitoring in Ukraine are presented in the table below.

Table 1. Orders related to environmental monitoring by the Ministry of Energy and Environment and Natural Resources

No.	Title of the document	Number	Date of approval
1.	Methodological guidelines for the preparation of regional and national environmental monitoring programmes.	487	24 December 2001
2.	Instruction on the procedure and criteria for registering enterprises that have or may have an adverse impact on the health of people and the state of the air in the atmosphere, the types and volumes of pollutants released into the atmosphere.	177	10 May 2002 (revised 25 May 2018)
3.	Regulations on information exchange between the	323	21 August 2002

⁴⁴ <https://zakon.rada.gov.ua/laws/main/2614-12>

⁴⁵ <https://menr.gov.ua/content/ekologichniy-monitoring-dovkillya.html>



No.	Title of the document	Number	Date of approval
	Ministry of Ecology and Natural Resources and other subjects of the environmental monitoring system in the process of regular environmental monitoring.		
4.	Methodological guidelines for the inventory of analytical control laboratories.	325	21 August 2002
5.	Nomenclature and designation of the structural elements of the State Environmental Monitoring System.	324	21 August 2002
6.	Organising and carrying out observations of the pollution of surface water.	89-M	04 June 2003
7.	Methodological guidelines on the establishment of the environmental monitoring system at the regional level.	467	16 December 2005
8.	Guidance on integrated environmental assessment at the regional level.	584	14 November 2008
9.	Methodology for monitoring surface water and groundwater.	4	14 January 2019
10.	Methodological recommendations for Strategic Environmental Assessment of state planning documents.	296	10 August 2018 (revised 18 July 2019)

Reforming environmental state monitoring

In 2019, two important steps were made to reform environmental monitoring in Ukraine, namely:

- A new framework for water monitoring⁴⁶ – this procedure fundamentally changed the existing monitoring system, since it created all the necessary prerequisites for observing the ecological and chemical status of surface water, groundwater and seawater. The new monitoring system will allow improvement of the understanding of the water situation in Ukraine. On this basis, more effective decisions can be made regarding the use and reclamation of water resources. In addition, it will allow obtaining data on the status of water bodies and river basins to be classified in an accessible manner.
- A new framework for air monitoring⁴⁷ – the implementation of the air monitoring system will ensure the prompt collection of data and assessment of the state of the air, which will enable effective management of decisions and control. It will also enable the public to participate in the development and formulation of policies to

⁴⁶ <https://www.kmu.gov.ua/ua/npas/pro-zatverdzhennya-poryadku-zdiysnennya-derzhavnogo-monitoringu-vod>

⁴⁷ <https://zakon.rada.gov.ua/laws/show/827-2019-%D0%BF>

<https://menr.gov.ua/news/33051.html>



improve air monitoring. The new system is implementing actions provided in the Ukraine-EU Association Agreement⁴⁸.

Environmental governance reform

The reform took place between 2010-2012 and resulted in the abolishment of the regional department of the Ministry of Environment and Natural Resources. These significant changes occurred in the Law on Amendments to Certain Legislative Acts of Ukraine to Optimise the Powers and Competences of the Executive Authorities in the Areas of Ecology and Natural Resources, including Local Authorities⁴⁹. This law amends several earlier laws and codes, including the Administrative Code, the Water Code, the law on Environmental Protection, the Law on Nature Reserve Fund, the Law on Environmental Expertise, among others. In addition, through this law, several competences (permits for certain activities, monitoring, supervision, expert reviews) were transferred from the central government (Ministry of Environment and Natural Resources) to local government institutions (oblast state administrations – OSA).

In April 2014, the CMU approved the “Concept for reforming local self-governance and territorial distribution of power in Ukraine”⁵⁰. This document led to the so-called “decentralisation of power” with the main goal to increase the effectiveness of local authorities. The decentralisation reform had three pillars:

- delegation of powers to the lowest possible level;
- delegation of financial competences in line with the powers delegated;
- state control over the activities of the local self-governing bodies.

Since 2014 significant changes have been introduced to the Tax Code and the Budgetary Code and the Regional Development Strategy was approved. The decentralisation reform took place simultaneously with reforms in the areas of local self-governance, administrative-territorial structure, state regional policy and sectoral reforms (including in the environmental area). As a result, many environmental issues were made the responsibility of the local authorities.⁵¹

Resolution of the Cabinet of Ministers of Ukraine No. 616-p of 31 May 2017 on the approval of the “Concept of reform system of state supervision (control) in the area of environmental protection”⁵²

In 2017, the government approved the concept for reforming⁵³ the system of state supervision (control) in the field of environmental protection. The document defines the establishment of

⁴⁸ [https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:22014A0529\(01\)](https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:22014A0529(01))

⁴⁹ <https://zakon.rada.gov.ua/laws/main/5456-17>

⁵⁰ <https://zakon.rada.gov.ua/laws/main/333-2014-%D1%80>

⁵¹ More information is available here: <http://www.rac.org.ua/vydannya/analitichni-dokumenty/regionalnyy-kontekst-vykonannya-ekologichnoyi-skladovoyi-ugody-pro-asotsiatsiyu-mizh-ukrayinoyu-ta-es-osnovni-vysnovky-analitichnyy-dokument--2017> and <http://www.rac.org.ua/vydannya/publikatsiyi/regionalnyy-kontekst-vykonannya-ekologichnoyi-skladovoyi-ugody-pro-asotsiatsiyu-mizh-ukrayinoyu-ta-es-doslidzhennya-2017>

⁵² <https://zakon.rada.gov.ua/laws/main/616-2017-p>



a single integrated body of supervision in the area of environmental protection and the elimination of duplicating functions in this area.

The main changes introduced refer to the following:

- the introduction of a national system of environmental monitoring;
- the establishment of a State Environmental Protection Service and, consequently, the closing down of the State Environmental Inspectorate;
- the development of new inter-regional environmental services within the newly established State Environmental Protection Service.

In addition, the concept laid the foundation for the transition from a system of total planned supervision (control) to the monitoring system, based on the prevention of violations of environmental legislation and the monitoring based on risk-oriented indicators.

National Environment Strategy 2020⁵⁴

The purpose of this national environmental policy is to preserve and improve the state of the environment by integrating the environmental policy into the socioeconomic development of Ukraine. It aims to guarantee a safe environment for the population and introduce a sustainable system of management and conservation of ecosystems.

The national environment strategy reflects the key environmental challenges in Ukraine and assigns priorities to air quality, water, land resources, forests, biodiversity, waste management and biosafety.

The strategy states that to tackle key challenges in the area of the environment, adequate governance, mechanisms and tools for environmental monitoring, collection, sharing and dissemination of information should be implemented.

Law on Basic Principles of the Environmental Policy for the Period up to 2030⁵⁵

This law contains a comprehensive list of strategic goals and objectives, and identifies two stages of implementation, as briefly described below:

- By 2025, it aims to have:
 - stabilised the environmental situation by fixing the changes in the public administration system that have occurred by reforming the public environmental management system;
 - implemented European environmental norms and standards;
 - improved environmental monitoring and control systems;

⁵³ <https://www.kmu.gov.ua/ua/npas/250269536>

⁵⁴ <https://zakon.rada.gov.ua/laws/show/2818-17/conv>

⁵⁵ <https://zakon.rada.gov.ua/laws/main/2697-19>



- introduced financial and economic mechanisms to stimulate environmentally-oriented economic structures;
- introduced mechanisms for stimulating enterprises to improve energy efficiency;
- introduced e-government tools;
- promoted environmental awareness and increased environmental consciousness of the public.
- By 2030, it is planned to have:
 - improved the environment through a balance between socioeconomic needs and environmental goals;
 - ensured the development of an environmentally effective partnership between the state and economic entities, and the public;
 - ensured sustainable low-carbon development that will lead to additional stimulus of the socioeconomic development of the country.

Hence, the law provides a series of elements to shape the state environmental policy, although many aspects remain vague in terms of practical implementation. In addition, the Ministry of Environment and Natural Resources developed the draft National Environmental Action Plan for the period 2020–2025 as a mechanism for the implementation of this strategy.⁵⁶

Resolution of the Cabinet of Ministers No. 825-r of 7 November 2018 on the approval of the “Concept for the establishment of the National Automated System ‘Open Environment’”⁵⁷

In November 2018, the CMU adopted the concept for establishing a national automated system of “Open Environment”⁵⁸. The resolution outlines the framework for developing a comprehensive environmental information management system. The system – called “Open Environment” – was established between 2018–2020. More information about the progress of the initiative is provided in Section 3.3.1. *Main initiatives*.

The system consists of five major components: (1) an environmental management system, (2) an analytical sub-system, (3) a portal of administrative services and state environmental registers, (4) a geoportal of environmental data and (5) an information sharing component. The last element – an information sharing component – serves the purpose of interoperability of data with national and international databases and systems.

⁵⁶ <https://menr.gov.ua/projects/167/>

⁵⁷ <https://zakon.rada.gov.ua/laws/main/825-2018-p>

⁵⁸ <https://menr.gov.ua/news/32130.html>



Resolution of the Cabinet of Ministers o No. 932-r of 7 December 2016 on the approval of the “Concept of implementation of the state policy in the field of climate change for the period up to 2030”⁵⁹

This resolution aims to improve the state policy on climate change, to ensure a gradual transition to a low-carbon society. To implement the concept, an action plan has been adopted on “The Implementation of the Concept and Strategy of Ukraine Low Carbon Development by 2030”⁶⁰. Even though the plan was adopted, some activities remain to be implemented.

3.1.2 Main international policies and agreements

Ukraine is involved in several international open data processes, also including environmental information sharing. The main policies and legal arrangements are presented below.

3.1.2.1 Multilateral environmental agreements setting out public access to information and reporting obligations

The Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention)⁶¹

Ukraine ratified the Aarhus Convention on 18 November 1999. Within its broad scope, the convention sets out obligations to provide effective public access to environmental information, information held by various public authorities, public participation in decision-making and access to justice in environmental matters. The progress of the implementation of the convention is reflected in the national implementation reports to the convention.⁶²

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 (Protocol on PRTRs)⁶³

Ukraine ratified the Protocol on PRTRs on 2 May 2016, becoming the 34th party to join this protocol to the Aarhus Convention. The protocol sets out the obligations to establish pollutant release and transfer registers, namely a national database or inventory of potentially hazardous chemical substances released into the air, water and soil and transferred off-site for treatment or disposal. As such, the inventory allows the public authorities to track each release and transfer of a hazardous chemical substance consistently over time. The progress on implementation is reflected in the national implementation reports to the protocol.⁶⁴

⁵⁹<https://zakon.rada.gov.ua/laws/show/932-2016-%D1%80>

⁶⁰ <https://zakon.rada.gov.ua/laws/main/878-2017-%D1%80>
<https://menr.gov.ua/news/31815.html>

⁶¹ <https://www.unece.org/env/pp/welcome.html>

⁶² <https://aarhusclearinghouse.unece.org/national-reports>

⁶³ <https://www.unece.org/env/pp/prtr.html>

⁶⁴ <https://aarhusclearinghouse.unece.org/national-reports>



Other related multilateral environmental agreements

This section analyses selected multilateral environmental agreements (MEAs) in terms of public access to information, reporting and monitoring requirements. The MEAs that are presented in the table below were chosen as examples to reflect on whether the country should carry out relevant monitoring, report data in thematic areas of water, air, biodiversity, climate change and the ozone layer and provide effective public access to information. For this report, the analysis focuses on the following:

- **public access to information.** In this respect, a review of official Ukrainian governmental institution portals was performed. The analysis shows the extent to which publicly available information covers the requirements of the MEA presented in the table below.
- **reporting.** In this case, a review of MEA related databases was performed to determine if the official national reports are provided by the Ukrainian governmental institutions. The analysis indicates whether the national report related to each specific MEA was submitted on time as required by the MEA presented in the table below.
- **monitoring activities.** For this aspect, a review of the monitoring activities as defined by the respective MEA and available in the official portals, as well as reports provided by governmental institutions, was performed. The analysis shows if the monitoring activity was performed on time as required by the MEA presented in the table below.

The table below presents the examples of the MEAs analysed in this section.

Table 2. Analysis of selected MEAs, in terms of public access to information, reporting and monitoring requirements (as of May 2020)

MEA	Public access to information	Reporting	Monitoring
UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention)	Yes ⁶⁵	Yes ⁶⁶	Yes ⁶⁷
UNECE Convention on Long-range Transboundary Air Pollution	Yes ⁶⁸	Yes ⁶⁹	Yes ⁷⁰
UNECE Protocol to the 1979 Convention on	Yes ⁷¹	Yes ⁷²	Yes ⁷³

⁶⁵ <https://www.sdg6data.org/country-or-area/Ukraine>

⁶⁶

https://www.unece.org/fileadmin/DAM/env/water/activities/Reporting_convention/Parties/UKRAINE_Reporting_Convention_6_5_2_Parties_23.02.2018.pdf

⁶⁷ <https://www.sdg6data.org/country-or-area/Ukraine>

⁶⁸ https://www.ceip.at/ms/ceip_home1/ceip_home/status_reporting/2020_submissions/

⁶⁹ https://www.ceip.at/ms/ceip_home1/ceip_home/status_reporting/2020_submissions/

⁷⁰ <http://openenvironment.org.ua/air/>

⁷¹ https://www.ceip.at/ms/ceip_home1/ceip_home/status_reporting/2020_submissions/



MEA	Public access to information	Reporting	Monitoring
Long-range Transboundary Air Pollution on the Reduction of Sulphur Emissions or their Transboundary Fluxes by at least 30 per cent			
UNECE Protocol to the 1979 Convention on Long-range Transboundary Air Pollution Concerning the Control of Emissions of Nitrogen Oxides or their Transboundary Fluxes	Yes ⁷⁴	Yes ⁷⁵	Yes ⁷⁶
UNECE Protocol to the 1979 Convention on Long-range Transboundary Air Pollution to Abate Acidification, Eutrophication and Ground-level Ozone	Not a party		
UN Convention on Biological Diversity	Yes ⁷⁷	Yes ⁷⁸	Yes ⁷⁹
UN Convention on Climate Change	Yes ⁸⁰	Yes ⁸¹	Yes ⁸²
UN Vienna Convention for the Protection of the Ozone Layer	Yes ⁸³	Yes ⁸⁴	Yes ⁸⁵
UN Montreal Protocol on Substances that Deplete the Ozone Layer	Yes ⁸⁶	Yes ⁸⁷	Yes ⁸⁸

* Explanation of the markings in the table:

- Yes – the country provides publicly available information on the official portals or in the official reports related to MEAs;
- No – the country does not provide information on the official portals or in the official reports;
- Not a party – the country has not acceded to the MEA.

⁷² https://www.ceip.at/ms/ceip_home1/ceip_home/status_reporting/2020_submissions/

⁷³ https://www.ceip.at/ms/ceip_home1/ceip_home/status_reporting/2020_submissions/

⁷⁴ https://www.ceip.at/ms/ceip_home1/ceip_home/status_reporting/2020_submissions/

⁷⁵ https://www.ceip.at/ms/ceip_home1/ceip_home/status_reporting/2020_submissions/

⁷⁶ https://www.ceip.at/ms/ceip_home1/ceip_home/status_reporting/2020_submissions/

⁷⁷ <http://dklg.kmu.gov.ua/>

⁷⁸ <https://www.cbd.int/doc/world/ua/ua-nr-05-en.pdf>

⁷⁹ <http://dklg.kmu.gov.ua/>

⁸⁰ https://ukrstat.org/en/operativ/operativ2009/ns_rik/ns_e/dvsr2008_e.htm

⁸¹ https://unfccc.int/sites/default/files/resource/asr2019_UKR.pdf

⁸² https://ukrstat.org/en/operativ/operativ2009/ns_rik/ns_e/dvsr2008_e.htm

⁸³

https://ozone.unep.org/countries/data?report_type=0&party%5B0%5D=232&period_start=1986&period_end=2019&output_type=odp-CO2e-tonnes

⁸⁴ <https://ozone.unep.org/countries/profile/ukr>

⁸⁵ <https://ozone.unep.org/countries/profile/ukr>

⁸⁶

https://ozone.unep.org/countries/data?report_type=0&party%5B0%5D=232&period_start=1986&period_end=2019&output_type=odp-CO2e-tonnes

⁸⁷ <https://ozone.unep.org/countries/profile/ukr>

⁸⁸ <https://ozone.unep.org/countries/profile/ukr>



3.1.2.2 Other international fora promoting the sharing and accessibility of environmental information

This section presents other international fora which promotes the sharing and accessibility of information.

“Environment for Europe” process

The first “Environment for Europe” ministerial conference took place in 1991 at Dobris Castle in the former Czechoslovakia. A set of basic guidelines for a pan-European cooperation strategy was laid down. The Shared Environmental Information System (SEIS) in the pan-European region was launched at the “Environment for Europe” ministerial conference in 2011.

In 2016, the eighth “Environment for Europe” ministerial conference took place in Batumi, Georgia. The ministers also signed the ministerial declaration “Greener, cleaner and smarter!” calling for the continuation of efforts and the further development of national information systems to have SEIS in place in the countries of Europe and Central Asia by 2021.

The next “Environment for Europe” ministerial conference will review progress in the area of environment and celebrate 30 years of the “Environment for Europe” process.

Ukraine has been actively involved in the “Environment for Europe” process since the second ministerial meeting in Lucerne, Switzerland, gradually implementing a number of decisions and recommendations from the conference.

Open Government Partnership initiative⁸⁹

The Open Government Partnership (OGP) is a multilateral initiative of national reformers, all determined to make their governments more responsive to the needs of the public. Ukraine has been implementing the recommendations of the OGP initiative since 2012. Since the start of the initiative, the following objectives related to public information have been achieved:

- provision of access to public information in the form of open data, including environmental data;
- improvement of public consultation procedures;
- launch of the unified state portal of administrative services, providing approximately 40 e-services related to the environment, such as the issuing of permits, declarations, certificates and others.

International Open Data Charter⁹⁰

The International Open Data Charter defines six principles on how data should be published: open by default, timely and comprehensive, accessible and usable, comparable and

⁸⁹ <https://www.opengovpartnership.org/countries/ukraine>

⁹⁰ <https://opendatacharter.net/>



interoperable, for improved governance and citizen engagement. Ukraine joined the Open Data Charter in 2016. It has helped to drive the open data agenda within the Ukrainian government.

The Ministry of Digital Transformation, with the support of a USAID, UK Aid and the Eurasia Foundation project⁹¹, developed a roadmap for the implementation of the country's commitment to open government data up to the public. The main measures include regulatory and organisational support, methodological support, evaluation of user demand for open data, development of the open data portal, promoting and increasing awareness about open data, the establishment of data quality control, development of data management procedures and encouraging innovation and the development of new projects based on open data.

Extractive Industries Transparency Initiative (EITI)

The Extractive Industries Transparency Initiative (EITI) is a global standard for the good governance of oil, gas and mineral resources. It seeks to address the key governance issues in the extractive sectors. The purpose of EITI implementation in Ukraine is to ensure transparency in the management of natural resources and disclosure of government revenue from the mining sector, primarily from the oil and gas companies, as well as from the coal and steel industries.

In the context of the EITI, Ukraine was the first country in the world⁹² to provide access to the register of legal entities, individual entrepreneurs and public organisations, and the register of assets for government officials related to the extractive industry sectors.

EITI acknowledged the progress and the achievements of Ukraine in opening the data on the company beneficiaries, and the Ministry of Justice was awarded a prize at the first national Open Data Awards competition.

3.1.2.3 Cooperation with the EU

This section provides an overview of the main agreements with the EU.

Declaration on Cooperation on Environment and Climate Change in the Eastern Partnership⁹³

In 2016, the European Union (EU) and the countries of the Eastern Partnership (EaP) adopted the declaration on Cooperation on Environment and Climate Change (Luxembourg Declaration). The declaration aims to strengthen regional cooperation on environmental and climate action, and sustainable development in the Eastern Partnership region, through implementing relevant international commitments such as the 2030 Agenda for Sustainable Development and the Paris Agreement on Climate Change. It seeks to raise awareness among and enhance the cooperate between relevant stakeholders, support the involvement of civil

⁹¹ <http://tapas.org.ua/en/all/news/dorozhnia-karta-rozvytku-vidkrytykh-danykh-v-ukraini-na-2017-rik-povnyj-tekst-2/>

⁹² <https://usr.minjust.gov.ua/ua/freesearch>

⁹³

http://ec.europa.eu/environment/international_issues/pdf/declaration_on_cooperation_eastern_partnership.pdf



society in decision-making process, strategic planning and implementation, and monitor the results of implementation of environmental policies, programmes and plans, and other commitments.

The second Eastern Partnership (EaP) ministerial meeting on the environment and climate change took place on 9 November 2018 in Luxembourg, co-organised by the European Commission and Austrian Presidency. The progress achieved by the countries was discussed and assessed in view of strengthening further the cooperation⁹⁴. The third Eastern Partnership high level meeting is scheduled now for early 2021 (while only a virtual summit will take place on 18 June 2020 due to coronavirus restrictions).

In 2017, Ukraine developed a roadmap⁹⁵ for the implementation of the Luxembourg Declaration. The roadmap aims to establish good environmental governance in Ukraine, with a view to opening the process of (environmental) policymaking. The key priorities of the roadmap include ensuring efficient and safe waste management, preventing and adapting to climate change, preservation of natural heritage, proper environmental governance and sustainable management of water resources.

Ukraine-EU Association Agreement⁹⁶

The signing of the Association Agreements between the EU and the three Eastern Partnership countries (Georgia, Moldova and Ukraine) in June 2014 catalysed the further advancement of the implementation of EU standards and principles in the above-mentioned countries. Further efforts in the cooperation with the EU will contribute to the implementation of the Association Agreements in certain areas of the environmental domain.

With this agreement, Ukraine committed, among others, to enhancing cooperation in the field of environmental protection and to the principles of sustainable development and greening of the economy. The cooperation aims to preserve, protect, restore and improve the quality of the environment, protecting human health, sustainable and rational use of natural resources and promoting measures at the international level to deal with regional and global environmental concerns.

In the annexe to the Association Agreement, several EU environmental directives relevant to access to environmental information and environmental monitoring are listed which should be implemented by Ukraine.

According to the report on the implementation of the Association Agreement between Ukraine and the EU from 2018⁹⁷, the progress made in performing the scheduled objectives

⁹⁴ Georgia progress factsheet: https://eeas.europa.eu/sites/eeas/files/eap_factsheet_georgia_en_web.pdf

⁹⁵ <https://menr.gov.ua/news/31791.html>

⁹⁶ [https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:22014A0529\(01\)](https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:22014A0529(01))

⁹⁷ <https://eu-ua.org/sites/default/files/inline/files/association-agreement-implementation-report-2018-english.pdf>



increased by 11% in 2018 against 2017, and 52% of the overall objectives have been implemented. The report confirms that the mechanism of strategic environmental impact assessment that was introduced, the newly adopted procedure for state water monitoring in line with the Water Framework Directive and the procedure for flood risk management that was introduced were essential for the environmental reform in the country.

EaP Connect Project⁹⁸

The EaP Connect Project was launched in July 2015. It aims to link the National Research and Education Networks in the partner countries to the pan-European research and education network GÉANT. It connects more than two million scientists, academics and students from 700 institutions across the region. The joint initiative of EU, Armenia, Azerbaijan, Belarus, Georgia, the Republic of Moldova and Ukraine is an example of joint efforts undertaken to foster the creation of digital economies and promote open data in the EaP countries⁹⁹.

3.1.3 National standards, interoperability and quality control

3.1.3.1 Metadata standards

The following table presents a brief description of metadata standards for open data, spatial data, environmental data and statistical data used in Ukraine.

Table 3. Metadata standards overview (as of May 2020)

Component	Metadata standards
Open data	Currently, there are no established metadata standards in the country which could be used for information exchange between systems. It is not clear how metadata is used and to what extent data and information providers are described through complete, accurate and detailed metadata records in practice. However, the metadata from the Ukrainian Open Data Portal is harvested by the European Data Portal, since data in the Ukrainian Open Data Portal is provided in a standardised structure, recognised by European Data Portal (e.g. CKAN, INSPIRE, DCAT-AP).
Geospatial	The geospatial data structure meets the requirements of the INSPIRE Directive ¹⁰⁰ , the international standards of ISO 19100 and the national standards that have been adapted on their basis.
Environmental information	No metadata information is publicly available for the environmental information published on various portals.

⁹⁸ <https://www.eapconnect.eu/>

⁹⁹ EDP Analytical Report, Open Data in the European Union Neighbourhood, p. 9

¹⁰⁰ 2007/2/EU of the European Parliament and of the Council of 14 March 2007



Component	Metadata standards
Statistical	<p>The official statistical website provides information about the metadata (meta description of state statistical observation). In particular, the metadata description is provided for these environmental statistics¹⁰¹:</p> <ul style="list-style-type: none"> • protection of atmospheric air; • generation and treatment of waste; • expenditure for environmental protection and ecological taxes; • environmental accounts for air protection.

3.1.3.2 Interoperability

Interoperability in Ukraine is ensured by a data exchange system of the state electronic information resource called “Trembita”. The system is used for organising the data exchange between government registers and helps to reduce the time needed to provide services as well as the efforts of users in gathering all documents needed for the application. It includes the development of organisational, technical and semantic interoperability of state registers, for example, the distribution of a unique record number in the single state demographic register which will combine data from various state registries and databases.

In December 2019, 40 state institutions¹⁰² signed agreements to connect to the Trembita system. The Trembita system is already integrated with:

- the state register of medical and drug licences;
- the state information system of the Ministry of Interior;
- the state register of civil documents;
- the state register of individual taxpayers;
- the state register of insured persons;
- the state registry of persons entitled to benefits;
- the state demographic registry.

Currently, the Trembita system is developed with international technical support¹⁰³ to enhance data exchange between state registries. Ukrainian cities are also developing connections to the Trembita system (Kharkiv, Lutsk, Kryvyi Rih).

3.1.3.3 Quality control of environmental data

The standards for data quality (including source, accuracy, timeliness and completeness of updates) on the official webpages of public authorities are regulated by the Resolution of the

¹⁰¹ http://www.ukrstat.gov.ua/metaopus/titul_18eng.htm#Environment

¹⁰² A full list of connected institutions is available here: <https://trembita.gov.ua/ua/news/40-derzhavnih-organiv-uklali-ugodi-pro-pidklyuchennya-do-trembiti>

¹⁰³ Projects of EGOV4UKRAINE “Support for E-Governance Decentralization in Ukraine” and Transparency and Accountability in Public Administration and Services (TAPAS)



Cabinet of Ministers of Ukraine No 3 of 4 January 2020 on the approval of the “Procedure for the publication on the internet of information on the activities of executive bodies”¹⁰⁴.

In addition, in 2017 the website of the Ministry of Environment and Natural Resources published the “Methodological recommendations on the preparation and design of the report on environmental audit”¹⁰⁵, which defines the quality controls and methodology for the preparation of the report (only available in Ukrainian).

The State Statistics Service also conducts the quality control of statistical observations based on principles such as adequacy, accuracy, timeliness, punctuality, accessibility and clarity, coherence and comparability. It also monitors how the principles of producing statistical information, as defined in Section III of the Principles of activity of the state statistical bodies¹⁰⁶, are met.

3.1.4 Institutional framework for environmental information management and stakeholder involvement

The following diagram illustrates the main environmental information, open data and e-governance stakeholders.

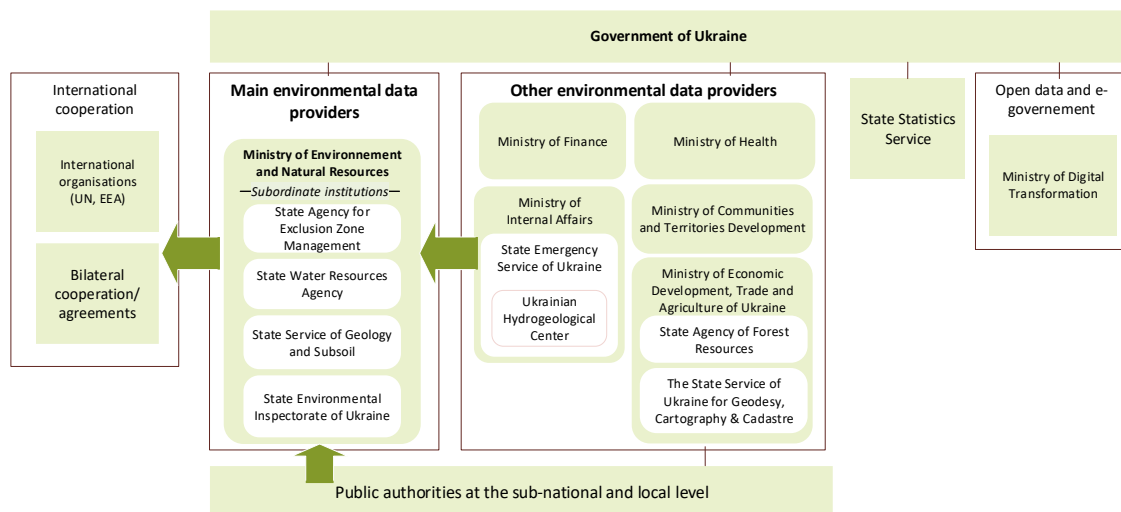


Figure 4. Institutional framework for environmental information, e-government and open data in Ukraine (as of May 2020, developed by the report’s authors)

¹⁰⁴ <https://zakon.rada.gov.ua/laws/main/3-2002-%D0%BF>

¹⁰⁵ <https://menr.gov.ua/content/metodichni-rekomendacii-shchodo-pidgotovki-zdiysnennya-ta-oformlennya-zvitu-pro-ekologichniy-audit.html>

¹⁰⁶ Decree of the State Statistics Service of Ukraine No 170 of 17 August 2018

In August 2019, the Ministry of Environment and Natural Resources was merged with the Ministry of Energy and Coal Mining to establish the Ministry of Energy and Environmental Protection. In May 2020, the changes in the institutional framework were made and the Ministry of Environment and Natural Resources was established. The most recent changes in the institutional framework and division of responsibilities are still ongoing and thus may not be fully reflected in this report.

Ministry of Environment and Natural Resources (MENR)¹⁰⁷

MENR is the main state authority whose key role is to develop and ensure the implementation of environmental policy. It operates in the field of environmental protection, treatment of waste, hazardous chemicals, pesticides and agricultural chemicals and coordinates state supervision (control) in the field of environmental protection.

The Ministry is responsible for the monitoring and reporting on the following thematic areas: air quality, protection of the ozone layer, conservation and protection of flora and fauna, protection and restoration of land and water resources (surface, ground and seawater) and efficient use of water resources. Moreover, the ministry ensures legal and regulatory governance of water management and land reclamation and efficient use of mineral resources. In addition, the ministry performs the state supervision on the fulfilment of the requirements defined by the environmental legislation.

State Service of Geology and Subsoil¹⁰⁸

The State Service of Geology and Subsoil of Ukraine (Derzhheonadra) is a central executive body, whose activities are directed and coordinated by MENR. The institution implements the state policy in the field of geology and rational use of mineral resources.

State Water Resources Agency¹⁰⁹

The State Water Resources Agency implements state policy in the field of water management and hydrotechnical land reclamation and management, land use and surface water resources management. The agency's key tasks are:

- execution of state policy in the field of management and use of surface water resources, development of water management and land reclamation and operation of state water management facilities of complex purpose, e.g. irrigation and drainage;

¹⁰⁷ <https://menr.gov.ua>

¹⁰⁸ <http://www.geo.gov.ua/>

¹⁰⁹ <https://www.davr.gov.ua/>



- submitting proposals to develop state policy in the field of water management and hydrotechnical land reclamation and management, use and restoration of surface water resources.

State Agency for Exclusion Zone Management¹¹⁰

The State Agency for Exclusion Zone Management is a central executive body focusing on continuous improvement of the quality of management related to the consequences of the Chernobyl disaster. It performs a number of activities related to environmental monitoring, as follows:

- conducting environmental and radioactivity monitoring in the zone;
- management of long-term storage and disposal of radioactive waste;
- monitoring and preservation of documentation on the subject of radioactivity;
- maintenance of a register of persons who have suffered as a result of the disaster.

State Environmental Inspectorate¹¹¹

The State Environmental Inspectorate is the central executive body whose activities are directed and coordinated by MENR. It implements state policy on supervision (control) in the field of environmental protection, rational use, protection and restoration of natural resources. Its main activities include the inspection of central executive authorities and their territorial bodies, local executive authorities and local self-government bodies on their compliance to the requirements of the legislation and developing proposals for the improvement of legislative acts to MENR.

Other environmental data providers:

- **Ministry of Health¹¹²**

The Ministry of Health is the central executive body in charge of the development and implementation of the state policy in the field of healthcare, as well as protection of the population against infectious diseases, combating HIV/AIDS and other socially dangerous diseases, and prevention of non-communicable diseases. In the context of the environment, the Ministry of Health provides data on drinking water quality, air pollution and soil contamination as well as health statistics.

- **Ministry of Communities and Territories Development¹¹³**

The Ministry for Communities and Territories Development is responsible for the development of housing and communal services, implementation of state policy concerning waste management, state policy in the field of construction, urban

¹¹⁰ <http://dazv.gov.ua/en/>

¹¹¹ <https://eng.dei.gov.ua/>

¹¹² <https://en.moz.gov.ua/>

¹¹³ <http://www.minregion.gov.ua/>



planning and spatial planning of territories and architecture. From the environmental perspective, the ministry provides data on waste management and water use.

- **Ministry of Finance**¹¹⁴

The Ministry of Finance is responsible for developing and implementing the national financial and budgetary policies, as well as defining national policies concerning taxation and customs duties. This also includes budget allocation for environmental protection activities.

- **Ministry of Economic Development, Trade and Agriculture**¹¹⁵

The Ministry of Economic Development, Trade and Agriculture is responsible for the development and implementation of state economic and social development policies, trade policy and state agriculture policy (beyond agriculture it also covers food, fisheries and forests). From the environmental perspective, the ministry provides data on land, agriculture and soil management.

- **State Service for Geodesy, Cartography and Cadastre**¹¹⁶

The State Service for Geodesy, Cartography and Cadastre (StateGeoCadastre) is a central executive body coordinated by the Ukrainian Ministry of Economic Development, Trade and Agriculture. StateGeoCadastre is responsible for the implementation of state policy related to topography, geodesy, cartography, land management and the state land cadastre. The key functions of StateGeoCadastre in relation to the environment are:

- implementation of state policy in the field of topographic-geodetic and cartographic activity, land management and planning;
- development of state geodetic network;
- development of the National Spatial Data Infrastructure and standards in the matter of geodesy and cartography;
- development of the National Register of Geographic Names;
- administration of the state land cadastre;
- providing the state registration of land parcels;
- management of state-owned agricultural land;
- maintaining the state land cadastre.

- **State Agency for Forest Resources**¹¹⁷

The State Agency for Forest Resources is a central executive body, whose activities are coordinated by the Minister of Economic Development, Trade and Agriculture and which implements state policy in the field of forestry and hunting.

- **Ministry for Internal Affairs**¹¹⁸

The Ministry for Internal Affairs is the main authority responsible for the development and implementation of state policy concerning of the protection of the

¹¹⁴ <https://mof.gov.ua/uk>

¹¹⁵ <http://www.me.gov.ua/>

¹¹⁶ <http://land.gov.ua/en/>

¹¹⁷ <http://dklg.kmu.gov.ua/>

¹¹⁸ <https://mvs.gov.ua/en/>



rights and freedoms of its citizens, the fight against crime, protection of public order, public safety, road safety, security and defence. The ministry coordinates the activity of the State Emergency Service and of the Ukrainian Hydrogeological Centre.

○ **State Emergency Service**¹¹⁹

The State Emergency Service is one of the central executive authorities that ensures the implementation of state policy in the field of civil protection, protection of the population and territories in case of emergencies, emergency management (including management of emergency response), rescue work, firefighting, fire and technogenic safety and accident rescue service activities.

○ **Ukrainian Hydrogeological Centre**¹²⁰

The Ukrainian Hydrometeorological Centre is a state institution under the State Emergency Service that conducts meteorological and hydrological observations over the country's territory. Within its competence, the centre implements state policy in the field of hydrometeorology and environmental monitoring and manages hydrometeorological activities. The centre's tasks include among others:

- contributing to the implementation of state policy in the field of hydrometeorological activities;
- analysing and forecasting weather conditions of the hydrological regime of rivers and reservoirs, of the agrometeorological conditions of vegetation and of the air pollution level in cities across Ukraine;
- collecting, processing and disseminating meteorological information and development of databases and data banks containing hydrometeorological data;
- methodologically guiding the area of hydrometeorology;
- testing the compliance of equipment for hydrometeorological observations, and for monitoring of environmental pollution.

State Statistics Service

The State Statistics Service is the administrative authority established under the Government responsible for leading and coordinating activity in the field of statistics. The main tasks of this service include:

- implementation of state policy in the field of statistics;
- advise to the Ministry of Economic Development, Trade and Agriculture on shaping state policy in the field of statistics.

¹¹⁹ <https://www.dsns.gov.ua/en/>

¹²⁰ <https://meteo.gov.ua/en/>



Ministry of Digital Transformation

Since October 2014, the State Agency for E-Governance of Ukraine was implementing state policy in the areas of e-government and information development. In September 2019¹²¹, the agency was transformed and upgraded to the Ministry of Digital Transformation of Ukraine.

After the changes in the governmental structure in 2019, the current ministry is responsible for the development of the digital economy, digital innovation, e-government and the development of social information. It also covers the development of digital skills and the digital rights of citizens, development of open data and national electronic information resources and interoperability. Furthermore, among its competences are the infrastructure development of broadband internet and telecommunications, e-commerce and business; development of electronic and administrative services; electronic trust services and electronic identification, and development of the IT industry.

Public authorities at sub-national and local levels

During the decentralisation reform, several functions (permitting certain activities, monitoring, supervision and environmental impact assessment) were transferred from the central government (MENR) to the local (regional) governments (oblast state administrations – OSA). The structure of departments varies and is determined by the decision of each OSA. All OSAs have divisions for waste management, water resources, monitoring and air pollution. Some of them established separate divisions for the environmental impact assessment, while others combined this function with other functions. Such diversity leads to difficulties when interacting with each other and with the central government authorities, which coordinate the overall activities at the national level.

There is a lack of information and assessment on how the reform was implemented and what the results were. The existing legislation, however, does not clearly specify the distribution of responsibilities for OSAs, reporting obligations and coordination procedures between OSAs and the central government institutions, and the environmental management set up on the ground remains , though and the environmental management set up on the ground remains not clearly defined.

The key competences and main responsibilities of the majority of OSA environmental departments cover:

- environmental monitoring and law enforcement;
- environmental permitting and licencing;
- environmental impact assessment;
- dissemination of environmental data and information.

¹²¹ <https://www.kmu.gov.ua/npas/pitannya-ministerstva-cifrovoyi-t180919>



According to the World Bank report “Ukraine country environmental analysis 2016”¹²², the coordination between regional environmental departments and other agencies remains weak. Even though by law the activities of OSA environmental departments are “regulated” by MENR, the coordination mechanisms need to be improved and harmonised.

Non-governmental organisations (NGOs)

According to the NGO portal of Ukraine and the World Bank Ukraine country environmental analysis 2016 report, there are approximately 1,500 non-governmental organisations across the country which included the goal of “protection of the environment” in their registration information (Single NGO Register). Nonetheless, in practice, the number is lower since many of these NGOs are associations for hunting and fishing.

Aarhus Centre¹²³

The Aarhus Centre has operated in Kiev since 2003 and focuses primarily on supporting public access to environmental information. The Aarhus Centre provides a variety of materials that facilitate public access to information:

- environmental impact assessment reports;
- periodical press and several environmental journals;
- various scientific literature and textbooks with environmental content, scientific and methodological research in the field, information on environmental protection and safety;
- fauna, soil science, international environmental conventions;
- ecological specialised dictionaries, etc.;
- environmental video materials and visual aids.

3.2 Environmental data flows

The following diagram illustrates the environmental data flows between Ukrainian institutions.

¹²² <http://documents.worldbank.org/curated/en/327881470142199866/Ukraine-Country-environmental-analysis>

¹²³ <https://aarhus.osce.org/centres/ukraine/kyiv>



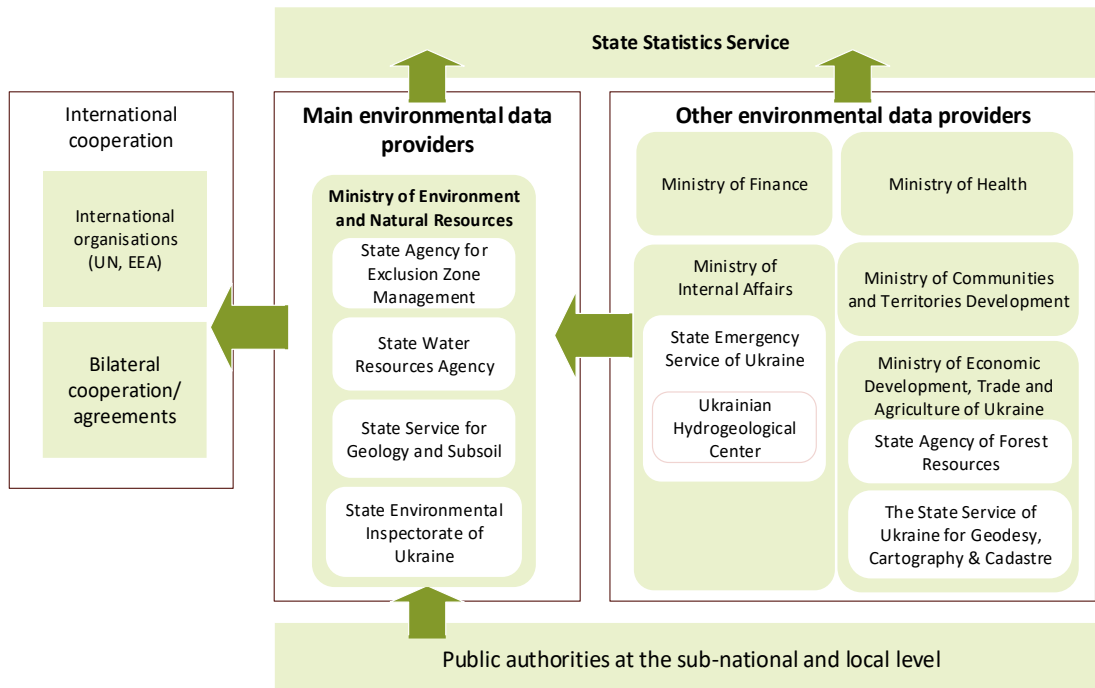


Figure 5. Overview of environmental data flows in Ukraine (as of May 2020, developed by the report's authors)

The Resolution of the CMU on the State Environmental Monitoring System¹²⁴ defines the collaboration mechanisms between different stakeholders regarding the monitoring of environmental activities and the flow of information between them. However, there is no clear separation of responsibilities between the state bodies at national and regional level, particularly, in the context of the last administrative reform and of the redistribution of competences between different environment bodies.

During round table discussions, organised in the context of the ENI SEIS II EAST project, in Kiev (26 September 2019) it was identified that in order to coordinate the exchange of environmental information, bilateral agreements have been signed between MENR, national environmental institutions and other environmental data providers.

The main system for environmental monitoring is the State Environmental Monitoring System (SEMS¹²⁵). In terms of information flow, MENR receives environmental data and information from other environmental data providers.

¹²⁴ <https://zakon.rada.gov.ua/laws/main/391-98-n>

¹²⁵ <https://menr.gov.ua/content/ekologichniy-monitoring-dovkillya.html>



The state entities which perform monitoring activities and information support using the SEMS include MENR, the State Water Resources Agency, the State Service of Geodesy and Subsoil, the State Emergency Service of Ukraine, the Ministry of Health, the Ministry of Communities and Territories Development of Ukraine, the Ministry of Economic Development, Trade and Agriculture, the State Forest Resources Agency and the State Service of Geodesy, Cartography and Cadastre.

3.2.1 Environmental assessment reports, indicators and available data

3.2.1.1 Environmental assessment reports

The ENI SEIS II East page¹²⁶ summarises the environmental reports prepared and made available by Ukrainian institutions. The main reports are described in the table below.

Table 4. List of the main environmental assessment reports in Ukraine (as of May 2020, based on the ENI SEIS II East project information)

Type of report	Information about the report
National environmental reports	National environmental reports Data source: https://menr.gov.ua/news/31768.html Prepared by the Ministry of Environment and Natural Resources Frequency: annual Last year published: 2015
Thematic reports – climate (national communications to UNFCCC)	National communication of Ukraine under the United Nations Climate Change Convention Data source: http://unfccc.int/national_reports/national_communications_and_biennial_reports/submissions/items/7742.php Prepared by the Ministry of Environment and Natural Resources Frequency: every four years Last year published: 2014
Thematic reports – land	Not publicly available
Thematic reports – air	Statistical bulletin on emissions of pollutants and greenhouse gases into atmospheric air from stationary sources of pollution Data source: http://www.ukrstat.gov.ua/druk/publicat/kat_u/publnav_ser_u.htm Prepared by the State Statistics Service Frequency: annual Last year published: 2016
Thematic reports – water	National report on drinking water quality and the status of drinking water supply in Ukraine: Data source: https://www.minregion.gov.ua/wp-content/uploads/2019/11/Natsionalna-dopovid-za-2018-rik.pdf

¹²⁶ <https://eni-seis.eionet.europa.eu/east/countries/ukraine>



Type of report	Information about the report
	Prepared by the Ministry of Development of Communities and Territories of Ukraine Frequency: annual Last year published: 2019
Thematic reports – biodiversity	National report under the Convention on Biological Diversity Data source: https://www.cbd.int/doc/nr/nr-06/ua-nr-06-en.pdf Prepared by the Ministry of Environment and Natural Resources Frequency: every four years Last year published: 2018
Thematic reports – waste	Annual briefing on municipal waste management Data source: https://www.minregion.gov.ua/napryamki-diyalnosti/zkh/terretory/stan-sfery-povodzhennya-z-pobutovymy-vi/ Prepared by the Ministry of Communities and Territories Development of Ukraine Frequency: annual Last year published: 2019
Indicator-based reports	Not publicly available
National Statistical Yearbook	National Statistical Yearbook Data source: http://ukrstat.gov.ua/druk/publicat/kat_u/publ1_u.htm Prepared by the State Statistics Service Frequency: annual Last year published: 2018
National Statistical Yearbook on the environment	National Statistical Yearbook on the environment Data source: http://www.ukrstat.gov.ua/druk/publicat/kat_u/publnav_ser_u.htm Prepared by the State Statistics Service Frequency: annual Last year published: 2018
Report on Sustainable Development	Sustainable Development Goals: Ukraine, 2017 national baseline report Data source: http://www.un.org.ua/images/SDGs_NationalReportEN_Web.pdf Prepared by the Ministry of Economic Development and Trade of Ukraine Frequency: not regular Last year published: 2017

3.2.1.2 UNECE environmental indicators produced by Ukraine

The following table provides information on the public availability of UNECE environmental indicators, as described by MENR^{127 128}.

¹²⁷ <https://menr.gov.ua/content/ekologichni-pokazniki.html>

¹²⁸ <https://eni-seis.eionet.europa.eu/east/countries/ukraine>



Table 5. List of UNECE environmental indicators produced on a regular basis by the governmental institutions of Ukraine (as of May 2020, developed by the report's authors)

Thematic areas	UNECE environment indicator	Status
A. Air pollution and ozone depletion	A1. Emissions of pollutants into the atmospheric air	Publicly available ¹²⁹ Frequency: annual
	A2. Ambient air quality in urban areas	Publicly available ¹³⁰ Frequency: annual
	A3. Consumption of ozone-depleting substances	Not publicly available
B. Climate change	B1. Air temperature	Not publicly available
	B2. Atmospheric precipitation	Not publicly available
	B3. Greenhouse gas emissions	Publicly available ¹³¹ Frequency: annual
C. Water	C1. Renewable freshwater resources	Not publicly available
	C2. Freshwater abstraction	Publicly available ¹³² Frequency: annual
	C3. Total water use	Publicly available ¹³³ Frequency: annual
	C4. Household water use per capita	Not publicly available
	C5. Water supply industry and population connected to the water supply industry and C6. Connection of population to public water supply	Publicly available ¹³⁴ Frequency: annual
	C7. Water losses	Publicly available ¹³⁵ Frequency: annual
	C8. Reuse and recycling of freshwater	Publicly available ¹³⁶ Frequency: annual
	C9. Drinking water quality	Not publicly available
	C10. BOD and concentration of ammonium in rivers	Publicly available ¹³⁷ Frequency: annual

¹²⁹ <https://menr.gov.ua/content/pokaznik-a1-vikidi-zabrudnyuyuchih-rechovin-v-atmosferne-povitrya.html>

¹³⁰ <https://menr.gov.ua/content/a2-yakist-atmosfernogo-povitrya-v-miskih-naselenih-punktah.html>

¹³¹ <http://seis.menr.gov.ua/indicators/B-3-UA.xls>

¹³² http://ukrstat.gov.ua/operativ/operativ2006/ns_rik/ns_e/opvvr_rik_e2005.htm

¹³³ http://ukrstat.gov.ua/operativ/operativ2006/ns_rik/ns_e/opvvr_rik_e2005.htm

¹³⁴ <https://goo.gl/PjFXtU>

¹³⁵ <https://menr.gov.ua/content/s7-biohimichne-spozhyvannya-kisnyu-bsk-ta-koncentraciya-azotu-amoniynogo-v-richkoviy-vodi.html>

¹³⁶ <https://menr.gov.ua/content/s--8-biogenni-rechovini-v-prisniy-vodi.html>

¹³⁷ <http://seis.menr.gov.ua/indicators/C-10-UA.xls>



Thematic areas	UNECE environment indicator	Status
	C11. Nutrients in freshwater	Publicly available ¹³⁸ Frequency: annual
	C12. Nutrients in coastal seawaters	Not publicly available
	C13. Concentrations of pollutants in coastal seawater and sediments (except nutrients)	Not publicly available
	C14. Population connected to wastewater treatment	Not publicly available
	C15. Wastewater treatment facilities	Publicly available ¹³⁹ Frequency: annual
	C16. Polluted (non-treated) wastewaters	Publicly available ¹⁴⁰ Frequency: annual
D. Biodiversity	D1. Protected areas	Publicly available ¹⁴¹ Frequency: annual
	D2. Biosphere reserves and wetlands of international importance	Not publicly available
	D3. Forests and other wooded lands	Not publicly available
	D4. Threatened and protected species	Not publicly available
	D5. Trends in the number and distribution of selected species	Not publicly available
	D6. Invasive alien species	Not publicly available
E. Land and soil	E1. Land uptake	Not publicly available
	E2. Area affected by soil erosion	Not publicly available
F. Agriculture	F1. Irrigation	Not publicly available
	F2. Fertiliser consumption	Publicly available ¹⁴² Frequency: annual
	F3. Gross nitrogen balance	Not publicly available
	F4. Pesticide consumption	Not publicly available
G. Energy	G1. Final energy consumption	Publicly available ¹⁴³ Frequency: annual
	G2. Total primary energy supply	Publicly available ¹⁴⁴

¹³⁸ <http://seis.menr.gov.ua/indicators/C-11-UA.xls>

¹³⁹ http://ukrstat.gov.ua/operativ/operativ2006/ns_rik/ns_e/opvvr_rik_e2005.htm

¹⁴⁰ http://ukrstat.gov.ua/operativ/operativ2006/ns_rik/ns_e/opvvr_rik_e2005.htm

¹⁴¹ <http://seis.menr.gov.ua/indicators/D-1-UA.xls>

¹⁴² http://ukrstat.gov.ua/operativ/operativ2018/sg/vmod/vmod1990-2018_e.xls

¹⁴³ http://ukrstat.gov.ua/operativ/operativ2016/sg/ekolog/engl/k_ensp_e.htm

¹⁴⁴ http://ukrstat.gov.ua/operativ/operativ2016/sg/ekolog/engl/zp_pen_e.htm



Thematic areas	UNECE environment indicator	Status
		Frequency: annual
	G3. Energy intensity	Publicly available ¹⁴⁵ Frequency: annual
	G4. Renewable energy consumption	Publicly available ¹⁴⁶ Frequency: annual
	G5. Final electricity consumption	Not publicly available
	G6. Gross electricity production	Not publicly available
H. Transport	H1. Passenger transport demand	Publicly available ¹⁴⁷ Frequency: annual
	H2. Freight transport demand	Not publicly available
	H3. Composition of road motor vehicle fleet by fuel type	Not publicly available
	H4. Age of road motor vehicle fleet	Not publicly available
I. Waste	I1. Waste generation	Publicly available ¹⁴⁸ Frequency: annual
	I2. Management of hazardous waste	Publicly available ¹⁴⁹ Frequency: annual
	I3. Waste reuse and recycling	Publicly available ¹⁵⁰ Frequency: annual
	I4. Final waste	Publicly available ¹⁵¹ Frequency: annual
J. Environmental financing	J1. Environmental protection expenditure	Publicly available ¹⁵² Frequency: annual

The table below provides a summary of the performance of UNECE environmental indicators provided by the institutions of Ukraine as presented on the ENI SEIS II East website. It indicates that in most categories Ukraine is producing up to 50 per cent of the UNECE indicators, which shows a large area for improvement.

¹⁴⁵ http://ukrstat.gov.ua/operativ/operativ2016/sg/ekolog/engl/enem_e.htm

¹⁴⁶ http://ukrstat.gov.ua/operativ/operativ2016/sg/ekolog/engl/esp_vg_e.htm

¹⁴⁷ http://ukrstat.gov.ua/operativ/operativ2015/sg/ekolog/engl/pt_e.xlsx

¹⁴⁸ http://ukrstat.gov.ua/operativ/operativ2015/sg/ekolog/engl/uv_e.xls

¹⁴⁹ http://ukrstat.gov.ua/operativ/operativ2006/ns_rik/ns_e/opap_rik_e2005.htm

¹⁵⁰ http://ukrstat.gov.ua/operativ/operativ2013/ns_rik/ns_e/pzppv_2013_e.htm

¹⁵¹ http://ukrstat.gov.ua/operativ/operativ2006/ns_rik/ns_e/opap_rik_e2005.htm

¹⁵² http://ukrstat.gov.ua/operativ/operativ2018/ns/vonsv/vonsv2018_e.htm



Table 6. Assessment of performance in producing UNECE indicators (as of May 2020, based on the ENI SEIS II East project information)

Thematic areas	Evaluation ¹⁵³
A. Air pollution and ozone depletion	
B. Climate change	
C. Water	
D. Biodiversity	
E. Land and soil	
F. Agriculture	
G. Energy	
H. Transport	
I. Waste	
J. Environmental financing	

0/No data	25%	50%	75%	100%
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It is recommended that Ukraine should increase the number of produced indicators, and to provide mechanisms to visualise, download and analyse them. Moreover, some indicators are outdated, e.g. A1. Emissions of pollutants into the atmospheric air was updated in 2013. Indicators should be updated regularly to provide relevant and reliable information on current situation.

3.2.1.3 Environmental statistics published

The State Statistics Service receives environmental data from government institutions responsible for data collection in this field and prepares environmental statistics related to the UNECE thematic areas. The environmental statistics are available for those thematic areas that have more than 50 per cent of the UNECE environmental indicators produced, in other thematic areas there are no environmental statistics. The table below lists environmental statistics, which are published on the State Statistics Service website¹⁵⁴.

Table 7. National environment statistics published (as of May 2020, developed by the report's authors)

Thematic area	Environmental statistics
A. Air pollution and ozone depletion	<ul style="list-style-type: none"> • Emissions of pollutants and carbon dioxide into the atmosphere • Emissions of sulphur dioxide and nitrogen oxides into the atmosphere • Emissions of pollutants into the atmosphere from stationary sources • Emissions of pollutants from mobile sources of pollution

¹⁵³ <https://eni-seis.eionet.europa.eu/east/countries/ukraine> on March 2020

¹⁵⁴ http://www.ukrstat.gov.ua/operativ/menu/menu_u/ns.htm



Thematic area	Environmental statistics
C. Water	<ul style="list-style-type: none"> • Use and protection of water resources (groundwater, freshwater consumption and capacity of treatment facilities)
I. Waste	<ul style="list-style-type: none"> • Waste generation and management • Waste generation by classification groups of the state waste classifier • Household and similar waste management • Waste management according to the classification groups of the state waste classifier • Generation and management of waste of I-III hazard classes by categories of materials • Generation and management of waste of I-IV hazard classes by categories of materials • Number of waste management facilities, specially designated places and waste disposal facilities
J. Environmental financing	<ul style="list-style-type: none"> • Expenditures on environmental protection by types of environmental protection measures • Expenditures on environmental protection by types of economic activity • Capital investments in environmental protection by types of economic activity with distribution by types of environmental protection measures • Capital investments in environmental protection by types of environmental measures • Current expenditures for environmental protection by types of environmental measures

3.2.2 Environmental data sharing arrangements/agreements

This section describes the main actors and the flow of environmental information between them.

Table 8. Inter-institutional cooperation for environmental data exchange (as of May 2020, developed by the report's authors)

Institution	Thematic areas	Inter-institutional cooperation for data exchange
Ministry of Environment and Natural Resources	A. Air pollution and ozone depletion C. Water E. Land and soil G. Energy ¹⁵⁵	Receives information from: <ul style="list-style-type: none"> • ministries and their subordinate institutions, including the Ministry of Health, the Ministry of Economic Development, Trade and Agriculture, State Forest Resources Agency of Ukraine and State Service of Geodesy,

¹⁵⁵ Due to recent changes in the institutional framework, the Ministry of Energy should take the mandate to monitor and provide energy-related data and information.



Institution	Thematic areas	Inter-institutional cooperation for data exchange
	I. Waste	Cartography and Cadastre; <ul style="list-style-type: none"> MENR's subordinate institutions, including, State Water Resources Agency of Ukraine and State Services for Geology and Subsoil; enterprises and organisations, and local authorities. Provides information to the State Statistics Service.
Ministry of Health	A. Air pollution and ozone depletion C. Water E. Land and soil	Receives information from its subordinate institutions, enterprises and organisations, and local authorities.
Ministry of Economic Development, Trade and Agriculture	C. Water D. Biodiversity E. Land and soil F. Agriculture	Receives information from its subordinate institutions, enterprises and local authorities.
State Forest Resources Agency	D. Biodiversity E. Land and soil	Receives information from the public institutions, enterprises and local authorities.
State Water Resources Agency	C. Water	Receives information from the public institutions, enterprises and local authorities.
State Service of Geodesy, Cartography and Cadastre	E. Land and soil	Receives information from the public institutions, enterprises and local authorities.
Ministry of Communities and Territories Development	C. Water I. Waste	Receives information from the public institutions, enterprises and local authorities.
State Service for Geology and Subsoil	C. Water E. Land and soil	Receives information from the public institutions, enterprises and local authorities.
State Statistics Service	A. Air pollution and ozone depletion B. Climate change C. Water D. Biodiversity E. Land and Soil F. Agriculture G. Energy H. Transport I. Waste J. Environmental financing	Receives information from: <ul style="list-style-type: none"> ministries, including the Ministry of Environment and Natural Resources, the Ministry of Health and the Ministry of Economic Development, Trade and Agriculture, its subordinate institutions, including, State Forest Resources Agency, State Service of Geodesy, Cartography and Cadastre, State Water Resources Agency, the Ministry of Communities and Territories Development and State Service for Geology and Subsoil; other enterprises and local authorities.
State Emergency Service	I. Waste	Receives information from the subordinate institutions managed by the State Emergency Service, enterprises and local authorities.
Ukrainian Hydrometeorological Centre	A. Air pollution and ozone depletion	Collects data from monitoring stations. Provides it to the State Emergency Service and the Ministry of Environment and Natural Resources (as



Institution	Thematic areas	Inter-institutional cooperation for data exchange
	C. Water E. Land and soil	a part of the State Environmental Monitoring System).

3.2.3 Licencing norms

The following table describes the licences available on the main environmental portals.

Table 9. Licencing norms per portal (as of May 2020)

Portal	Licencing
Open Data Portal	All of the content on the national Open Data Portal is licenced under the Creative Commons Attribution 4.0 International License (CC BY 4.0) ¹⁵⁶ unless otherwise stated.
MENR website	All information provided on the MENR website is protected by copyrights to MENR. MENR departments share information they have with the public upon request via the MENR website. As a rule, MENR defines which environmental information can be published/shared from the OSAs – this implies that the local authorities (OSAs) need a prior authorisation to share their information.
State Statistics Service website	All content on the portal is licenced under the Creative Commons Attribution 4.0 International License (CC BY 4.0) unless otherwise stated.

3.3 Progress so far

3.3.1 Main initiatives

Ukraine has made a lot of progress in terms of e-services and open data. In this section, more details are provided on the main initiatives shaping the e-government and open data landscape in Ukraine.

Civic engagement and capabilities for open data

Government authorities engage the public in the development of information systems and in promoting the reuse of data. A recent consultation on open data availability indicated a move towards engaging the public to use more open data.

NGOs in Ukraine are actively involved in the development of open data portals. For example, the open data portal was developed in partnership between PO SocialBoost and the Ukrainian Government (as described in Section 4.1 *Portals*).

¹⁵⁶ CC BY 4.0 licence allows freely to share (copy and redistribute the material in any medium or format) and re-use (transform, combine and build upon the material for any purpose, even commercially) data while giving the appropriate credit, such as providing a link to the licence and indicating if changes were made.



Currently, the eco-portal is being developed by the Open Society in the partnership with MENR (as described in the initiative below).

There is a notable ICT sector, even if the apps economy is developing and growing. Universities produce a significant number of technical graduates, have a track record of ICT collaborations with the private sector and are carrying out advanced research in leading areas like analytics, advanced statistics and semantic web technologies.

Development of the concept for the national automated system “Open Environment”¹⁵⁷

Open Environment is a nationwide automated information-analytical system in the field of environmental protection, rational use and protection and restoration of natural resources, which should facilitate free access to environmental information in Ukraine. In addition, the development of the automated “Open Environment” system is a relevant and important step for a nationwide process of modernisation and implementation of e-governance¹⁵⁸. The implementation of the “Open Environment” system results in:

- the modernisation of the process of collection and analysis of environmental data;
- an efficient and integrated environmental monitoring system;
- effective and prompt decision-making on environmental safety and environmental risk management in Ukraine and on a transboundary context;
- the electronic format of the procedure providing administrative environmental services on the portal of administrative services and state ecological registers;
- open environmental data according to the obligations of the International Open Data Charter;
- a platform for transparent dialogue between authorities and with the public;
- the incentive for involving citizens, civil society institutions and business entities in environmental activities;
- mechanisms to prevent and minimise corruption risks;
- the improvement of the image and role of Ukraine and MENR in international negotiations on environmental protection, e-government and e-democracy.

Currently, the Open Society developed the Open Access Environment¹⁵⁹ platform, which provides public access to information on the management of natural resources in Ukraine.

In May 2019, the first pilot modules of the Open Environment Geoinformation System – Water, Air and EcoFinance¹⁶⁰ were launched. They contain data from the state eco-monitoring

¹⁵⁷ <https://menr.gov.ua/news/32130.html> <https://menr.gov.ua/en/news/32615.html>

¹⁵⁸ <https://zakon.rada.gov.ua/laws/main/825-2018-p>

¹⁵⁹

http://openenvironment.org.ua/index.htm?utm_source=openaccess&utm_medium=banner&utm_campaign=home

¹⁶⁰ http://www.unece.org/fileadmin/DAM/env/pp/a_to_i/Joint_UNECE-EEA_workshop/Presentations/OD4E_3_10_Ukraine_Sierova_Averin.pdf



system in Ukraine and public finances for environmental purposes respectively. Information on the state of surface and groundwater pollution are also available in the test mode of the Open Access Environment in cooperation with MENR. At the end of the testing period (planned for December 2019, but no information on the current status are available), this system will be handed over to the government for use and further maintenance and update.

Establishment of the National Spatial Data Infrastructure (NSDI) in Ukraine

The establishment of the National Spatial Data Infrastructure in Ukraine enabled the enrichment of geographic data. Furthermore, the National Spatial Data Infrastructure facilitates access to, and use of, the data required for implementing the SEIS principles. The establishment of the National Spatial Data Infrastructure was conducted bearing in mind the provisions of the EU INSPIRE directive¹⁶¹.

Due to the development of National Spatial Data Infrastructure, governmental institutions, local self-governments and the public can rely on a complete and reliable information base for decision-making in the areas of land management, urban development, construction and engineering surveys, environment, national defence and security. The NSDI included development of both the main spatial data platforms and procedures for spatial data collection, update, sharing, dissemination and monitoring.

The StateGeoCadastre is responsible for the implementation of the NSDI initiative. While preparing for the NSDI's development, the following activities were completed for December 2019¹⁶²:

- development and implementation of the state coordinate system USC2000;
- start of the development of geo-informational systems (GIS) for urban management, geoportals for urban development documentation;
- launch of the registry of geographical names;
- establishment of standards for geographical information in the country;
- preparation and submission to EuroGeographics the sets of topographical geospatial data for the territory of Ukraine according to the specifications of EuroGlobalMap and EuroRegionalMap;
- establishment of the SubGroup for Coordination of NSDI Creation in Ukraine;
- preparation of the draft Strategy for NSDI development for the period 2020–2023 (yet to be approved by the government).

Currently, there are four main geoportals in the country, as follows:

¹⁶¹ Directive 2007/2 European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information Infrastructure in the European Union

¹⁶² <http://digitalukraine2019.ukrgeo.ua/wp-content/uploads/2019/05/3.-Presentation-of-the-concept-of-creating-National-Spatial-Data-Infrastructure-NSDI-of-Ukraine-StateGeoCadastre-2.pdf>



- Public Cadastral Map of Ukraine¹⁶³;
- GIS National Spatial Data Infrastructure¹⁶⁴;
- Geoportal of State Geodetic Network of Ukraine¹⁶⁵;
- Geoportal of State Cartographic and Geodetic Fund of Ukraine¹⁶⁶.

StateGeoCadastre plans to continuously cooperate with state institutions and geospatial data providers in terms of data integration and to provide open data based on GIS technologies for public access and reuse.

CORINE Land Cover portal¹⁶⁷

The CORINE Land Cover portal was developed within the context of the ENI SEIS II East project funded by the European Union and is available on the Ministry of Environment website. The data resulting from the CORINE Land Cover pilot project cover the area around the capital city of Kiev and can be accessed from the portal for further use and reuse.

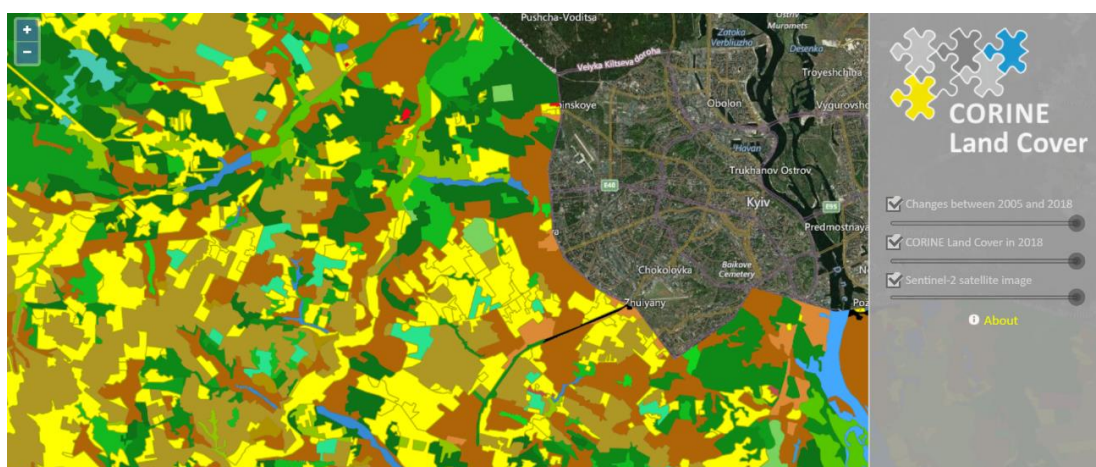


Figure 6. Screenshot of the CORINE Land Cover portal (as of May 2020, <http://seis.menr.gov.ua/clc/>)

¹⁶³ <https://map.land.gov.ua/>

¹⁶⁴ <https://nsdi.land.gov.ua/login>

¹⁶⁵ <https://dgm.gki.com.ua/>

¹⁶⁶ <http://geodata.land.gov.ua/login>

¹⁶⁷ <http://seis.menr.gov.ua/clc/>



SaveEcoBot¹⁶⁸

SaveEcoBot is an app developed by the Save Dnipro activist group designed to aggregate data on permits and procedures for environmental pollutants, environmental taxes, and air quality and disseminate environmental information. The app covers:

- monitoring of the EIA register that depicts the stages of the environmental impact assessment procedure for the planned activity of the company;
- data on permits for the emissions of harmful substances into the atmosphere from stationary sources;
- data on special permits for the use of subsoil;
- data on permits for special water use;
- data on licences for handling hazardous waste.

3.3.2 International rankings

International rankings are important, as they assess progress made against other countries based on internationally acknowledged methodologies.

E-government Development Index (EGDI)

As a composite indicator, the EGDI is used to measure the readiness and capacity of national institutions to use ICTs to deliver public services. Its components include the Online Service Index (OSI), Telecommunication Infrastructure Index (TII) and Human Capital Index (HCI).

In 2018, Ukraine scored 0.6165 and was ranked #82 out of 193 countries. The figure below shows the change of EGDI throughout the period. Ukraine aims to fight corruption in the country, delivering corruption-free public services quickly and conveniently. The government portal ¹⁶⁹ also provides online access to public services. In addition, institutions can develop their own portals for accessing online services. The next steps for Ukraine will be on the establishment of a single access point (portal) to all (or most) e-services for citizens and business entities.

¹⁶⁸ <https://www.saveecobot.com/en/main/>

¹⁶⁹ <https://www.kmu.gov.ua/>



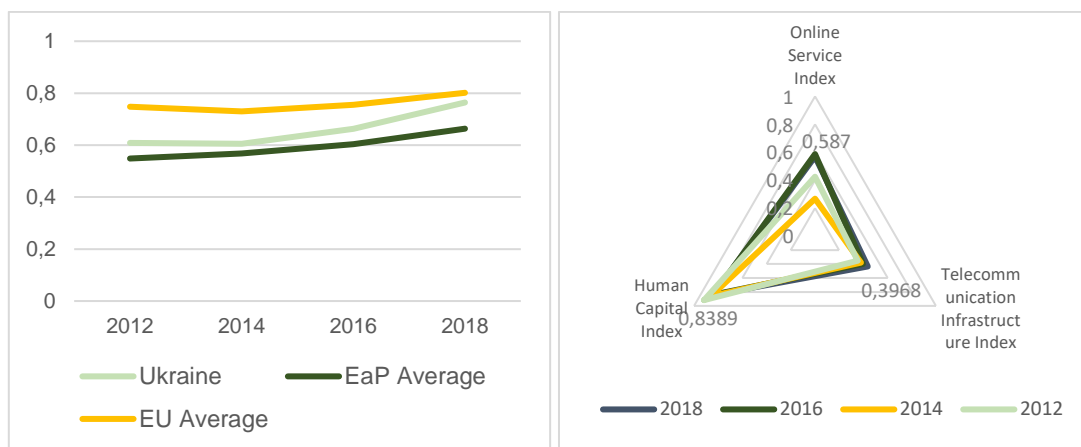


Figure 7. EGD of Ukraine (2012–2018) (based on EGD data, developed by the report's authors)

As indicated in Figure 6 (graph on the right), TII improved slightly in recent years (2016–2018). However, nearly 35% of the rural population as well as 53% of schools and 99% of medical institutions in Ukraine lack access to broadband internet¹⁷⁰. To develop the digital economy and society in the country, the Ukrainian government adopted and is currently implementing a roadmap¹⁷¹ for the period 2018–2020.

Global Open Data Index¹⁷²

The Global Open Data Index is the annual global benchmark for the publication of open government data, run by the Open Knowledge Network. The survey is designed to assess the openness of specific government datasets according to the Open Definition in 16 different areas including the government budget, spending and procurement, access to information about land ownership, election results at all levels and national statistics.

In 2017 (the latest year when this exercise was run), Ukraine ranked #31 out of 94 countries and scored 48% out of 100. In spite of this decent ranking, only 20% of datasets were open, according to the definition (*“Open means anyone can freely access, use, modify and share for any purpose (subject, at most, to requirements that preserve provenance and openness).”*).

Open Data Inventory (ODIN) score¹⁷³

The Open Data Inventory (ODIN) assesses the coverage and openness of official statistics to help identify gaps, promote open data policies, improve access and encourage dialogue between national statistical offices and data users.

¹⁷⁰ https://www.itu.int/en/ITU-D/Regional-Presence/CIS/Documents/Events/2018/05_Kiev/ITU%20Seminar%2016.05.18%20-%20Olga%20Gusyeva.pdf

¹⁷¹ <https://issuu.com/mineconomdev/docs/>

¹⁷² <https://index.okfn.org/place/ua/>

¹⁷³ <http://odin.opendatawatch.com/Report/countryProfile/UKR?appConfigId=4>

Ukraine ranked 89th in the Open Data Inventory 2018 with an overall score of 42%. The overall score is a combination of the data coverage sub-score of 47% and the data openness sub-score of 38%. Ukraine scores lower than the regional average across all three major data categories. Within the country, the highest level of coverage and openness is on economic information and the lowest level is on social information. Environmental information is ranked in the middle. More specifically, the environment coverage sub-score is 57% and openness sub-score is 40%.

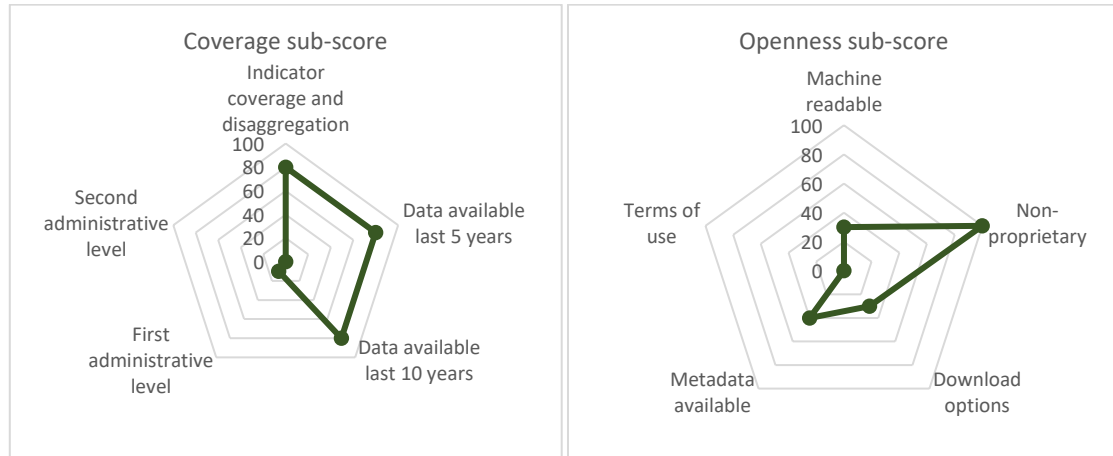


Figure 8. Coverage sub-score and openness sub-score of environment statistics, 2018 (based on ODIN data, developed by the report’s authors)

Open Data Barometer

The Open Data Barometer is produced by the World Wide Web Foundation with the support of the Omidyar Network and aims to uncover the readiness, implementation status and impact of open data initiatives around the world. It analyses global trends and provides comparative data on governments and regions using an in-depth methodology that combines contextual data, technical assessments and secondary indicators.

The first graph shows Ukraine’s progress according to the Open Data Barometer parameters. The second graph compares the EaP average of 2016 (the latest scores available for Belarus, Georgia, the Republic of Moldova and Ukraine) with Ukraine’s score. Ukraine’s score for 2017 is also provided for reference. In general, Ukraine is clearly above the average and represents, therefore, a good example for other EaP countries.



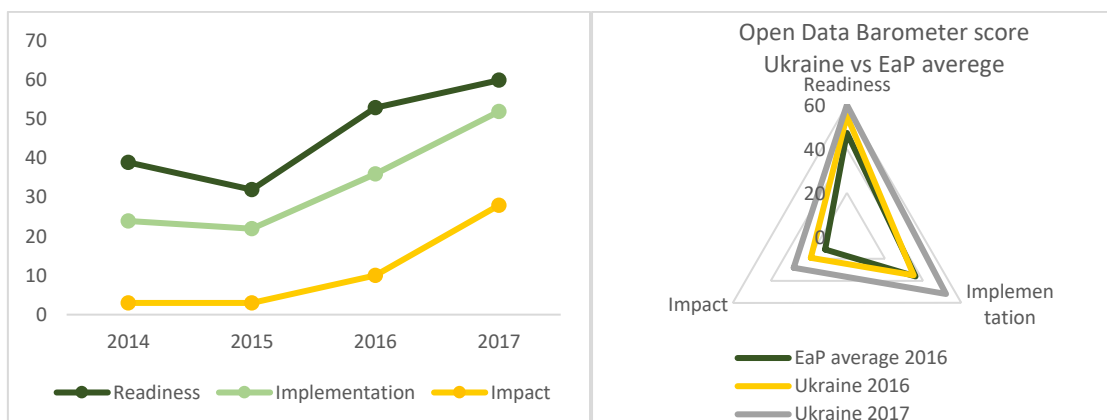


Figure 9. Open Data Barometer score results 2014–2017 (based on Open Barometer data, developed by the report authors)

The following table provides more details about the Open Data Barometer assessment in terms of environmental data availability (or related).

Table 10. Open Data Barometer environmental evaluation (2017 status and progress evaluation based on 2020 findings. Based on Open Barometer data, developed by the report authors)

	Environmental data		Cartography	
	2017	2020	2017	2020
Data exists	●	↑	●	↑
Online availability	●	↑	●	↑
Machine-readable	●	↑	●	↑
Reusable data	●	↑	●	↑
Free of charge	●	↑	●	●
Open licence	●*	↑	●	↑
Data validity	●	●	●	●
Data update	●	↑	●	●
Data discovery rating	●	↑	●	↑
Metadata	●	↑	●**	↑

Note: During the period of preparation of the report, updated information about the open data was captured which showed progress in specific areas. Therefore, the columns in the table above represent:

- 2017 – Open Data Barometer environmental evaluation;
- 2020 – the progress evaluation based on the report findings mainly related to the recent developments of the Open Data Portal, the Open Environment Portal and the NSDI initiative.

● – Yes, ● – No, ↑ – improvement in the area, ● – no significant changes in the area.

* The licence is now specified on the Open Data portal but should be transposed to other platforms to maintain consistency between licencing norms across platforms providing the same data.

** The evaluation from the Open Data Barometer might not take into consideration the implementation of INSPIRE.

The table above shows that Ukraine still has a lot to do in terms of data availability, regular data updating and metadata standards. For the latest, Ukraine could consider adopting an international metadata standard such as DCAT-AP and provide strict rules and procedures for the publication of open data.



Environmental Performance Index¹⁷⁴ (EPI)

The Environmental Performance Index (EPI) ranks countries on 24 performance indicators across 10 categories covering environmental health and ecosystem vitality. These metrics provide a gauge at a national scale on how close countries are to established environmental policy goals.

In 2018, Ukraine ranked 109th out of 180 countries with a score of 52.87 out of 100. The figure below shows the main indicators of the Environmental Performance Index in Ukraine.

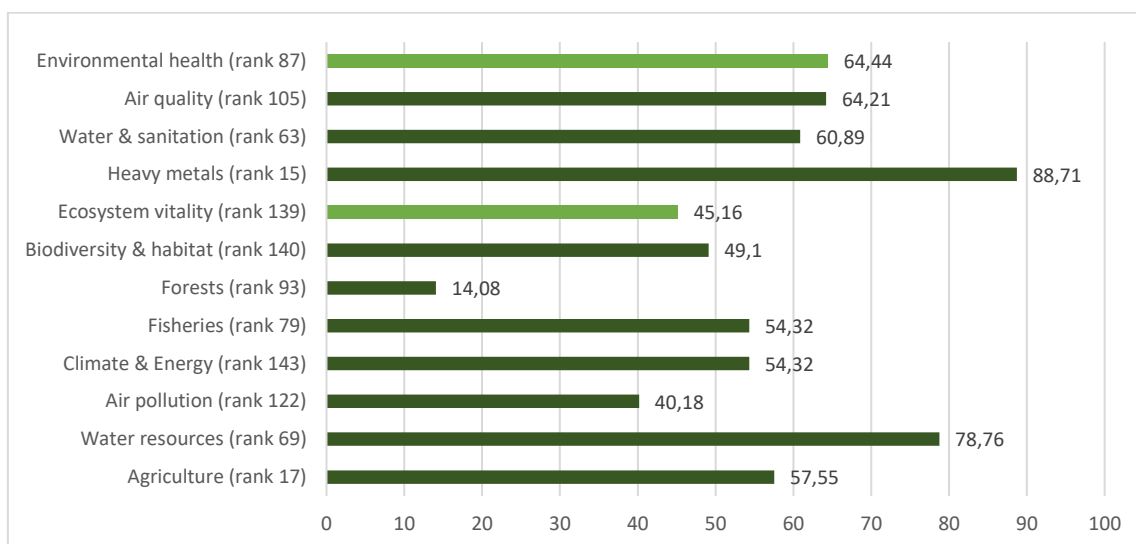


Figure 10. Indicators of EPI of Ukraine (2018, <https://epi.envirocenter.yale.edu/epi-country-report/UKR>)

3.3.3 ICT related statistics

According to the International Telecommunication Union¹⁷⁵, at the end of 2018 Ukraine had:

- Fixed-telephone subscriptions per 100 inhabitants: 14
- Mobile-cellular subscriptions per 100 inhabitants: 122
- Fixed (wired)-broadband subscriptions per 100 inhabitants: 12
- Mobile-broadband subscriptions per 100 inhabitants: 45
- Households with a computer (%): 62
- Households with internet access at home (%): 60
- Individuals using the internet (%): 58.9

¹⁷⁴ <https://epi.envirocenter.yale.edu/epi-country-report/UKR>

¹⁷⁵ The country profile with the latest data: <https://www.itu.int/net4/itu-d/icteye/CountryProfile.aspx>



4 Technology enablers for environmental information sharing

4.1 Portals

This section provides insights into the platforms available for the publication of environmental data and information at a national and international level.

4.1.1 Open Data Portal

In 2014, the national Open Data Portal was launched by PO SocialBoost¹⁷⁶ in cooperation with the Ukrainian Government. The portal is intended to provide access to public information in the form of open data and provides access to information held by governmental institutions. In addition, there is a possibility to subsequently using this information. Any person may freely copy, publish, distribute and use it, including for commercial purposes, in combination with other information or by including public information in its product in the form of open data with the obligatory reference to the source of such information.

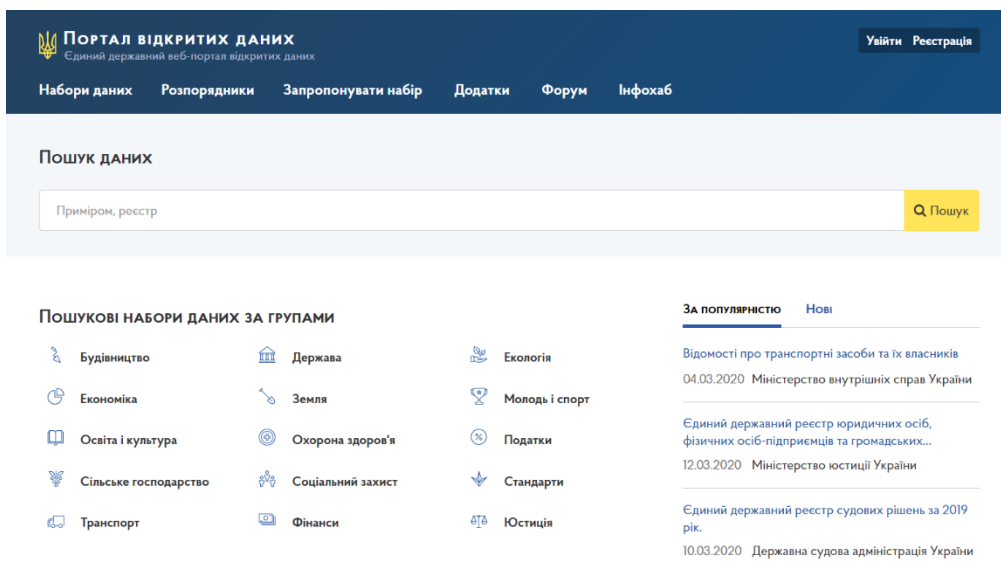


Figure 11. Ukrainian Open Data Portal (as of May 2020, <https://data.gov.ua/>)¹⁷⁷

¹⁷⁶ SocialBoost is a tech NGO in Ukraine. It is a platform where IT-enthusiasts, companies and government bodies work together to engage in socially important IT projects.

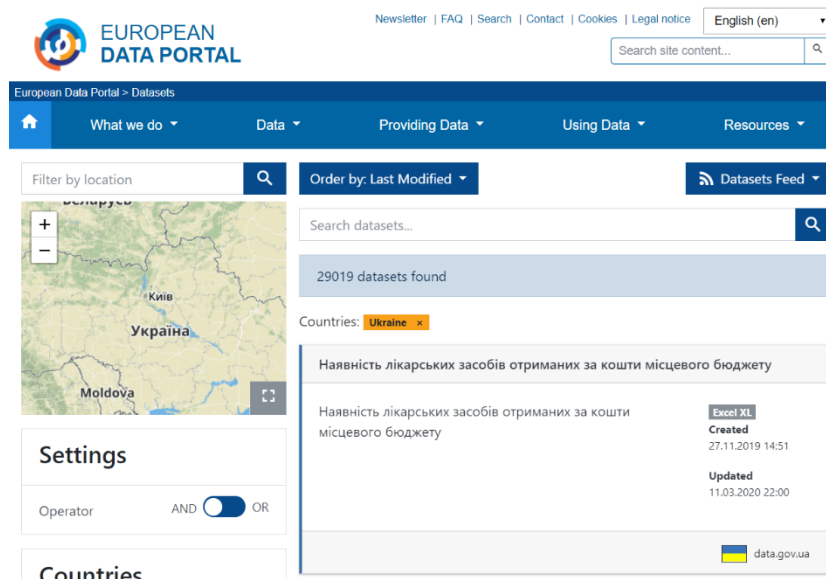
¹⁷⁷ <https://data.gov.ua/>



In August 2018, the new version of the Open Data Portal was launched. The Open Data Portal was developed by the Opendatabot team within the framework of the USAID, UK Aid and the Eurasia Foundation, Transparency and Accountability in Public Administration and Services, in partnership with the Eastern Europe Foundation and the Agency for E-Governance. The updated portal was moved from the DKAN¹⁷⁸ platform to the CKAN¹⁷⁹ platform which is widely used for national open data portals. The new portal has a harvesting function that allows it to automatically take open data from other portals of cities or regions in Ukraine through the API if other portals allow it as well.

In addition, the platform enables new functions for information managers to adjust the automatic update of data. Data users can preview the datasets before downloading them and give feedback through comments. The open data portal has an improved search function of open datasets by allowing the user to filter data by institution, keywords, file format, quality and publication date. However, all datasets uploaded before August 2018 are available on the old version of the portal and there is no indication as to whether they will be transferred to the new platform. To this date, there are less than 20 datasets related to the environment.

The metadata from the portal is harvested by the European Data Portal¹⁸⁰. This means that datasets are described by metadata and provided in a standardised structure recognised by European Data Portal (CKAN or INSPIRE or DCAT-AP).



¹⁷⁸ DKAN is an open data platform with a full suite of cataloguing, publishing and visualisation features that allows governments, non-profits and universities to easily publish data to the public.

¹⁷⁹ The Comprehensive Knowledge Archive Network is an open-source open data platform for the storage and distribution of open data.

¹⁸⁰ <https://www.europeandataportal.eu/en/homepage>



Figure 12. Ukrainian datasets on the European Data Portal (as of May 2020)

4.1.2 E-government portal

The e-service portal of Ukraine is igov.gov.ua¹⁸¹. It provides online services for both businesses and citizens. Services are grouped into categories such as: social services, services for business entity registration, medical services and others. It is possible to use the portal to make public information requests from government institutions.

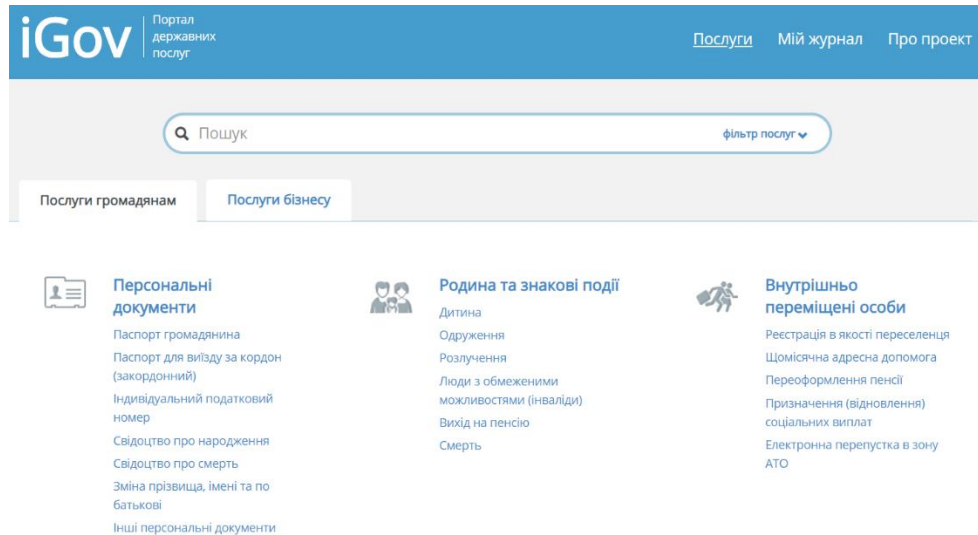


Figure 13. E-service portal (as of May 2020)

The goal of the portal is to “translate” all possible public service delivery procedures into a transparent, high-quality and efficient electronic format. The portal is used as a public service catalogue providing information about service delivery processes and links to different government information resources used for e-service delivery.

The portal is available in the Ukrainian language only. Currently there are 404 public services available online and more than 600 currently being developed. The project was created by volunteers.

¹⁸¹ <https://igov.gov.ua/> in May 2020



4.1.3 Environmental portals

4.1.3.1 Platforms and portals of the national institutions

The table below presents the main national platforms and portals that are used to publish environmental data.

Table 11. Platforms of national authorities (as of May 2020)

Institution	Description
MENR website https://menr.gov.ua	<p>MENR publishes environmental information and the results of its work on the website www.menr.gov.ua.</p> <p>However, some information is outdated. Any person and/or organisation may request the information they need from MENR by sending an official letter to the ministry.</p> <p>The MENR website is user-friendly but the English version contains limited information.</p>
Interactive map of MENR https://ecomapa.gov.ua	<p>An interactive map enables members of the public to submit geo-referenced and photo-based information that identify waste disposal sites on the platform. MENR redirects such information to the local authorities responsible for managing the area of landfills. Information on the processing status of submissions and the corresponding actions of the local authorities are publicly available.</p> <p>Separate layers on the map show data from the state register of waste disposal sites and landfill sites.</p>
Shared Environmental Information System Ukraine http://seis.menr.gov.ua	<p>The website was developed by MENR to publish information regarding disseminating environmental information in Ukraine under the ENI SEIS II East project.</p> <p>It also links to the CORINE Land Cover pilot for Ukraine that provides the view of land cover around the capital Kiev.</p>
State Statistics Service website http://ukrstat.gov.ua	<p>The website was established to improve the usability of published information and data of the State Statistics Service of Ukraine.</p> <p>Data are published in the form of static tables and can only be downloaded in xlsx format.</p> <p>The official statistical website provides information on the metadata (metadata description of the state statistical observation) and quality control methods used (in the quality reports and methodological documents, but only in the Ukrainian language).</p>
Environmental Impact Assessment (EIA) Register http://eia.menr.gov.ua/	<p>The EIA register allows an environmental impact assessment to be performed online without direct contact between the developer and the authority. It provides access to all documents through the Register within the EIA procedure and which are at the disposal of the authorities as soon as they become available. Currently, the registry function is in testing mode and additional</p>



Institution	Description
	features and better functionality is being developed ¹⁸² .
Web portal on protected areas http://pzf.menr.gov.ua/	Natural Reserve Fund of Ukraine (managed by MENR) contains maps and other information regarding protected areas (land and water), natural complexes and ecosystems that have special conservation status and scientific, aesthetic, recreational and other values.
Clean Water portal http://texty.org.ua/water/	The portal is an interactive map of river pollution in Ukraine based on data from the State Water Agency. There are more than 400 river water control points on the map. Users can view up to 16 pollution parameters and find out how their levels changed over the past five years.

4.1.3.2 Other platforms for environmental information

Several recent initiatives developed by NGOs or other organisations are increasing access to various types of environmental information. They are presented in the table below.

Table 12. Platforms for environmental information developed by NGOs or other organisations (as of May 2020)

Organisation	Description
Open Access Environment https://openaccess.org.ua/	<p>The website provides a geoportal with the following features:</p> <ul style="list-style-type: none"> • Selection of geospatial data and administrative units; • Management map display; • Choice of pollution indicators; • Display of the pollution index; • Management the chronological display; • Provision of detailed information on observation points with the ability to control the display period; • Forming downloadable diagrams; • Access to data; • Display of downloadable financial metrics. <p>The Open Access Environment works in close collaboration with environment stakeholders to identify potential open data and to assist public institutions in preparing and sharing it. Currently, data from three environment domains are available – air, water and environment financing¹⁸³.</p>

¹⁸²

http://www.unece.org/fileadmin/DAM/env/pp/ppdm/8th_PPDM/Statements_and_Presentations/8TFPP_2_4_PP_Ukraine_Sierova.pdf

¹⁸³

http://openenvironment.org.ua/index.htm?utm_source=openaccess&utm_medium=banner&utm_campaign=home



Organisation	Description
Waste Ukraine Analytics https://probono.org.ua/wua	Waste Ukraine Analytics is the only open-source platform for aggregating waste data. The platform has a marketplace feature that enables selecting waste providers/sources and waste management/recycling facilities. The goal of the platform is to increase the recycling rate and reduce the burden on landfills and incinerators in the country.

4.2 Environment open data availability and reuse

The table below presents a comparison between the Open Data Portal and the website of the State Statistics Service in terms of data availability and reusability of data.

Table 13. Comparison of the Open Data Portal and the website of the State Statistics Service (as of May 2020)

	Open Data Portal	State Statistics Service website
Statistics related to the availability of environmental data online	The Open Data portal evolved quickly from a small collection of public datasets to becoming the primary source of public sector information. Currently, the portal consists of more than 31,000 datasets from almost 9,000 data providers. According to the OGP initiatives, considerable work, however, remains to be done to develop open data accessibility. The low quality of data and a poor understanding of open data principles by government officials are the key issues to be further addressed.	The website publishes numerous environmental data in the field of waste, air, water, environmental expenditures as well as agriculture and energy. The website does not provide data visualisation functionalities, most data are presented in static tables or are available in xlsx files.
Reusability of data	Among all available datasets, about 40% are available in a machine-readable format. The portal does not have a format classification (organisations type formats and do not choose from the list), hence the formats are not described in a structured or unified way.	According to the Open Data Barometer, national environmental statistics of Ukraine are available online ¹⁸⁵ . However, not all data are available in machine-readable and reusable formats, or free of charge. Open data are difficult to find; there are no search or filter mechanisms.

¹⁸⁵ https://opendatabarometer.org/4thedition/detail-country/?_year=2016&indicator=ODB&detail=UKR



Open Data Portal	State Statistics Service website
<div data-bbox="496 309 847 544"> <ul style="list-style-type: none"> ■ Machine-readable formats ■ Non-machine readable formats </div> <p data-bbox="448 555 890 656"><i>Figure 14. Formats of datasets in the Ukraine Open Data portal (as of May 2020)¹⁸⁴</i></p> <p data-bbox="443 696 895 1543">During the Transparency and Accountability in Public Administration and Services programme, a survey of open data experts and open data portal representatives was conducted, based on a questionnaire for open data maturity developed by the European Commission. Ukraine scored 645/1,090 on open data readiness (EU average: 597) and 160/250 on portal maturity (EU average: 161). The <i>Open Data Maturity in Europe 2019 report</i> groups countries according to their open data maturity status, into beginners, followers, fast trackers and trend setters. Based on the scores, Ukraine belongs to the group of “followers”, characterised as a group of countries that have “successfully developed a basic open data policy” but still have limitations in open data availability and use.</p>	<p data-bbox="919 271 1370 618">It is only possible to browse through categories of different statistical information including environmental information and data. The open data is difficult to find, there are no search and filter mechanisms. It is only possible to browse through categories of different statistical information including environmental information and data.</p> <p data-bbox="919 663 1370 1189">Most datasets in the environmental domain are available in the Ukrainian and English languages and can be downloaded in <i>xlsx</i> format. Usually, annual data are provided in separate files, so a comparison between yearly data can be difficult. In addition, the State Statistics Service publishes statistical yearbooks, including one on the environment. Yearbooks can be downloaded in <i>pdf</i> and <i>xlsx</i> formats, however, most of the information in the yearbook is provided only in the Ukrainian language.</p>

¹⁸⁴ Prepared using <https://data.gov.ua/>





5 Achieving a high level of maturity for environmental information management

5.1 Main challenges

5.1.1 E-government

The major challenges related to e-governance initiatives in Ukraine are structured according to SEIS pillars and are presented in the table below.

Table 14. Major challenges related to e-governance


<p>Content</p> 	<ul style="list-style-type: none"> • Lack of legal framework regulating the sphere of e-service provision. Even though over the past years a set of important documents related to introducing e-services has been approved in Ukraine, systematic and integrative implementation of e-services requires definitions for rules, standards and formats in the sphere of e-services at a national level. An example of this challenge is the application of the law on Environmental Impact Assessment (EIA). The EIA Register was meant to be an information tool; however, it does not have a formal status of e-service and does not share the same quality standards as other e-services in Ukraine. • Lack of integration of the environment in the e-government framework. The absence of a connection between the various environmental initiatives and the e-governance framework leads to situations where environmental institutions develop their standards and platforms that are difficult to connect and integrate afterwards. • Poor multilingual support. The absence of good translation on the e-service portal and most government websites undermines international collaboration and limits accessibility and use.
<p>Infrastructure</p> 	<ul style="list-style-type: none"> • Lack of integrated identifiers linking similar information from various state information resources (interoperability). This challenge may cause serious difficulties in terms of establishment of organisational, legal and semantic interoperability of state information resources. • Lack of interoperability for state electronic information resources. Currently, various platforms and portals are developed in the area of e-government, though unified standards and platforms for data exchange are still rarely used. The “Trembita” information system is used as an interoperability platform in Ukraine, however, it integrates just a small part of state electronic information resources.
<p>Cooperation</p> 	<ul style="list-style-type: none"> • Low willingness/awareness level among civil servants to implement e-government solutions. According to various surveys and assessments related to e-readiness of Ukraine, there is quite a low level of understanding of e-governance among civil servants.



5.1.2 Open data

The major challenges related to electronic access to information and open data are structured according to SEIS pillars and are presented in the table below.

Table 15. Major challenges related to open data

<p>Content</p> 	<ul style="list-style-type: none"> • Inconsistent implementation of open data initiatives. Although the overall legislative framework represents a supportive environment for open data initiatives, a significant share of the laws and reforms are either very new or still in the process of implementation, thus, continuous support for implementation and development is needed. • The low maturity level of data published. Ukraine is progressing fast by opening large number of datasets; by May 2020 more than 30,000 datasets were available on the Ukrainian open data portal. But most datasets are published under a low level of maturity (e.g. a single dataset can have 3 xlsx files with different structures) and/ or not in a machine-readable format (only 40 per cent of datasets are machine-readable). Therefore, reusability is limited. • Poor multilingual support. The absence of good translation on the open data portal and most governmental websites jeopardises international collaboration, access and wide use of the information. • Lack of well-established/documented procedures on quality assurance and quality control along the data production workflow. The lack of established and documented quality control procedures could lead to different data quality levels and consequently difficulties in compiling, aggregating and comparing the data. • Lack of integrated approaches, rules, standards, technical regulations in the sphere of electronic access to information and open data. There are no coherent management procedures or standards for data, information security or data quality, including provenance, accuracy, timeliness and completeness consistently implemented across the governmental institutions. There is no overview of the various databases or data hosted by the different governmental bodies. Some government data remain paper-based, and machine-readable data are often not published even if it exists inside the institutions. Data sharing happens only on a case-by-case basis and obtaining data is generally difficult and inefficient. • Lack of availability of the metadata undermines reuse of open data. Lack of metadata in existing open data solutions leads to difficulties to the searching, discovery and reuse of open data. The open data portal of Ukraine has implemented a metadata description. However, other portals with publicly available data lack metadata descriptions. In addition, there is no metadata standard applied at a national level.
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<p>Infrastructure</p> 	<ul style="list-style-type: none">• Lack of mechanisms and practices for the protection of data privacy. The protection of data privacy is regulated by law but not all government institutions have implemented practical procedures or mechanisms to guarantee or safeguard the protection of data privacy in practice. There are no anonymisation practices implemented across governmental institutions to safeguard the protection of personal data.• No government ICT interoperability frameworks exist. Ukraine developed the “Trembita” system that is used for data exchange in the governmental sector. However, the system itself does not specify practical mechanisms to ensure interoperability of governmental software especially in the design and development stages. As a result, governmental institutions in Ukraine manage their information and data in a variety of complex systems (including state registers, departmental e-document management systems, standard activity automation systems and management decision-making support systems). The main problem is that they are not compatible and use different standards for data exchange. All these lead to a decentralised integration approach and do not allow the full potential of the “Trembita” system development to be reached.
<p>Cooperation</p> 	<ul style="list-style-type: none">• Lack of efficient communication between public authorities, NGOs and economic agents. Public authorities are not very eager to implement tools for public monitoring surveys, inspection or surveillance over their activities by the public and NGOs. As a rule, an initiative on communication building is boosted by representatives of NGOs. These initiatives lack support from governmental institutions in the development stages, which would allow results to be reached quicker and at a higher extent. For example, the development of the Open Data Portal was started by PO SocialBoost in cooperation with the Government of Ukraine. Involvement of other institutions in this initiative could have resulted in a higher quality of datasets and would have supported cooperation between governmental institutions and NGOs in the area of open data.• Lack of qualified staff in state institutions to work on open data. This situation could cause difficulties when introducing new technologies for preparing and maintaining open data.• Lack of continuous development of open data initiatives as the effective use of the results from various projects and building on the progress already made is limited. International donors provide various support to the development of open data initiatives, though after finalisation most of these initiatives are discontinued and not further developed. This approach does not allow Ukraine to achieve greater open data development progress or to make faster advances in this area.



5.1.3 Environmental information sharing

The main challenges related to environmental information management are structured according to SEIS pillars and are presented in the table below.

Table 16. Major challenges related to environmental information management

<p>Content</p> 	<ul style="list-style-type: none"> • Lack of concrete implementation plans for environmental strategic documents. Ukraine’s strategy documents in the area of the environment lack clear plans for implementation of the various objectives and initiatives they refer to. The lack of clear prioritisation among the different environmental goals and their associated monitoring and reporting obligations also undermines opportunities for implementation by failing to be adapted to financial and human resource scarcity. There is a lack of a clear baseline or realistic target indicators, a lack of clear time frames in the national plans of measures and weak integration of environmental considerations into sectoral strategies, programmes and activities. A regular review mechanism to assess progress in the implementation and help further refining of the strategic documents is also missing. • Environmental information is shared on multiple platforms. It is hard for an end-user to know what is available and where. In this regard, it is only the State Statistics Service which is providing information in a consistent form or a systematic structure. • Low maturity level of environmental datasets. Most datasets are available in non-machine-readable formats, thus the reusability of such data is limited. • Lack of unified licencing approach. While more and more Ukrainian institutions adopt CC licences for information sharing, the inconsistency of licencing remains. The majority of institutions copyright their content, restraining the access and sharing of environmental information, public accessibility and reuse of environmental information.
<p>Infrastructure</p> 	<ul style="list-style-type: none"> • Lack of a common framework for environmental data management. The decentralisation process taking place in Ukraine since 2014 is further complicating the situation by not offering a common framework describing standard software solutions, integration standards and procedures for collection, update, sharing, disseminating or using environmental information at the local level. • Complex architecture for environmental data exchange. Environmental data are published on multiple portals. In addition, the responsibilities related to SEMS are divided between multiple entities at various levels.
<p>Cooperation</p> 	<ul style="list-style-type: none"> • The role of local (regional or municipal) institutions is not clearly defined. At present, each oblast has several agencies with responsibilities for natural resources, permitting, inspection and law enforcement – and there is no procedure outlining the coordination mechanisms between them. Consequently, the system of environmental management at the sub-national level requires considerable effort to develop and organise.



This situation is also a consequence of the fact that legislative acts are not consistent, secondary legislation covering regulatory and implementing acts are often missing and the functions of various agencies are not clearly defined. All these shortcomings result in gaps for some functions and overlap with the central level on other functions.¹⁸⁶

- **The reattribution of responsibilities to OSA entities under the present decentralisation reform has diminished the efficiency of the established governance model.** The split of responsibilities was made without adapting all procedures for effective implementation and without allocating the necessary resources or tools associated with these tasks.

5.2 Roadmap¹⁸⁷

In general, it is recommended that Ukraine should focus on some key elements for following coherent and effective open data and environmental information management and for addressing the common challenges presented above. In brief, the focus should be on the following:

- **Policy measures:**
 - *Long-term digital action plan:* an action plan for e-government and open data should be in place. It should ensure scoping, management and funding of the national e-government and open data portals, as well as digital awareness-raising activities for both governmental institutions and the public. In doing so, all available results acquired from previous activities and projects across the whole economy spectrum should be assessed and put in motion.
 - *General interoperability framework:* the country should have in place an interoperability framework or at least its foundation. This is especially required to further develop “Trembita” system and ensure sustainable integration of other information resources including environmental information systems.
 - *General interoperability framework:* the country should have in place an interoperability framework or at least its foundation. This is especially required to further develop “Trembita” system and ensure sustainable integration of other information resources including environmental information systems.

¹⁸⁶ Ukraine Country Environmental Analysis, 2016, World Bank.

¹⁸⁷ The proposed roadmap has been updated taking into consideration the presentation made during the 4th ENI SEIS II East Project Steering Committee Meeting on 12 November 2019 in Copenhagen. Presentations are available here: <https://eni-seis.eionet.europa.eu/east/areas-of-work/communication/events/project-related-events/4th-eni-seis-ii-east-project-steering-committee-meeting>



- *Roadmap in the field of open data and environmental information*: this roadmap should contain key objectives for fostering sharing and dissemination of environmental information. During the implementation of ENI SEIS II East project the roadmap, introduced in the following section, was developed; it can serve as a basis or inspiration to practically implement suggested measures, create new ones and enhance open data and environmental information sharing initiatives.
- **Legal measures:**
 - *Enforcement mechanisms* for the regular collection, sharing and dissemination of environmental information and for the implementation.
- **Technical measures:**
 - *E-government, open data and geoportals*: the country should have effective e-government, open data, environmental portals on which environmental data and information can be shared/disseminated with spatial attributes, and where services can be built.
 - *Implementation of international standards*: standards developed by EU, the International Organization for Standardisation (ISO), the World Meteorological Organisation, the Open Geospatial Consortium, the World Wide Web Consortium, the National Institute of Standards and Technology and other international organisations which are responsible for standards development could be adjusted and introduced in the areas of designing an information system, metadata standards, and interoperability standards.

Some of these elements are already in place in Ukraine (e.g. the data exchange platform “Trembita”). Nonetheless, it is advised to look at all these aspects from the integrated perspective of environmental information sharing and dissemination and to update them where appropriate. These elements are under continuous development; hence a periodic review is necessary.

Guidance for the implementation of the roadmap

The roadmap provided in the following section outlines key areas for further development in the field of open data and environmental information. It also provides recommendations and suggested actions for improvement that are organised according to the following SEIS pillars: content, infrastructure, and cooperation.

The success and rapid advancement of the country in this challenging domain are strongly dependent on clear priority setting, multidisciplinary teamwork and regular monitoring and adjustment of the results. Furthermore, as progress is gradually made in one or several areas proposed for consideration, improvements, readjustments or amendments to the roadmap will be needed to keep it relevant and focused on the key priorities of the country.

To support the implementation process of the proposed measures at the national level, it is recommended to start by establishing an interdisciplinary team that would be responsible for driving and overseeing the overall process. The measures should be prioritised and implemented to support and enhance the e-government, open data and environmental strategies of the country. Furthermore, this process should not be carried out in isolation. On



the contrary, it should be undertaken by taking into account the extensive experience already gained in this area by other countries and organisations and in the context of a broad regional exchange and international collaboration.

The measures proposed are to be implemented by specific bodies at various levels of decision-making and across disciplines. In this respect, the measures are grouped into three major categories namely: policy measures, legal measures and technical measures. These categories are indicated by the colour scheme (provided in the table below). They aim to signal the leading expertise or decision-making level required for the implementation of each measure while being considered in an interdisciplinary setting.

Table 17. Legend for the colour scheme of the roadmap measures

Colour	Type of measure	Description
	Policy	The measures in this category cover the development of specific strategies and policies and their integration into the overall policy framework at the national level. They include establishing clear and measurable targets as well as monitoring the implementation of the strategies and policies. Furthermore, they imply supervision, coordination and other practical arrangements in terms of interdisciplinary work on open data and e-governance across various areas including the environment.
	Legal	The measures in this category cover the development and adoption of new legislation or the revision of the existing one followed by the development of secondary legislation, guidelines and methodologies in the area of open data and e-governance across various domains, including the environment. Legal measures include governance setup, ensure clear division of responsibilities and propose enforcement mechanisms for obligations defined in the legislation. Legal measures include governance setup, ensure clear division of responsibilities and propose enforcement mechanisms for obligations defined in the legislation.
	Technical	The measures in this category cover the adoption or development of technical tools, methodologies and procedures, as well as the introduction and adoption of international technology standards at a national level. These measures also embrace developing new competencies and training specialists to ensure the successful implementation and sustainability of technology initiatives.

It is recommended that Ukraine should implement measures proposed in the roadmap after consideration of the latest policy, legal and technology changes happening in the country. The table below suggests a recommended timeframe to implement measures with different priorities assigned.

Table 18. The recommended timeframe for the implementation of measures

Priority	Recommended timeframe for the measure implementation
High	In next 1–3 years
Medium	In next 3–5 years
Low	Over the next five years



Priorities proposed in this roadmap were based on information received and aggregated from 2018 to 2020. Depending on the measure implementation, changes in the policy, legislation or technology the suggested priorities might change. To ensure effective implementation of proposed measures and their relevance regular measure monitoring is essential.

“Open data and e-government good practices for fostering environmental information sharing and dissemination” report

The implementation of the proposed measures in the roadmap is assisted by a good practices report, the “Open data and e-government good practices for fostering environmental information sharing and dissemination” (the Good Practices Report). This report is an integral part of the present project and presents relevant examples from other countries and organisations on the practical implementation of the roadmap measures.

The Good Practices Report is organised into two sections – e-government and open data – each part following the SEIS pillars “content”, “infrastructure”, and “cooperation (network)”. In addition to this, the following resources can also be used to support the implementation of the measures proposed in this roadmap:

- Report on the “Promotion of good practices for national environmental information systems and tools for data harvesting at EU level”;
- Streamlining Environmental Reporting in the EU – Action Plan;
- Open Data Maturity in Europe 2019^{188, 189};
- Development of an assessment framework on environmental governance in the EU Member States¹⁹⁰.

5.2.1 Roadmap measures: Content

The measures proposed to Ukraine in this SEIS category “Content” are summarised in the table below.

Table 19. Measures related to SEIS pillar: Content

Measure	Priority	Description
1. Revision of the legal framework to promote and regulate the online accessibility and reuse of public sector	High	Adopt or amend as needed, the legal acts referring to data management and accessibility related to environmental domain (monitoring, assessment and reporting, management and control of natural resources, ecosystems and pollution) in accordance

¹⁸⁸ Report for 2019 available from 2nd December 2019, at <https://www.europeandataportal.eu/en/dashboard/2019>

¹⁹⁰ “Development of an assessment framework on environmental governance in the EU Member States” under the contract No 07.0203/2017/764990/SER/ENV.E.4 funded by the European Commission, Final report May 2019.



Measure	Priority	Description
information (PSI)		<p>with the Aarhus Convention, the Protocol on PRTRs (as appropriate) and the Open Environment concept. This can include:</p> <ul style="list-style-type: none"> • Improving environmental information system by defining themes, sources (lists, registers, databases, resources, etc.), formats, metadata, licencing and interoperability requirements. In particular, publish the list of potential datasets per domain or thematic area that are open for access (e.g. The Ministry of Justice in its order 897/5¹⁹¹ ¹⁹²from 2016 provides a list of datasets, which will be opened for access); • Improving the division of the roles and responsibilities between public authorities and with other stakeholders at all levels and across the sectors to ensure coordination in maintaining, access and use of Open Environmental Information System and Open Data Portal and other relevant information systems (e.g. statistical, geospatial); • Improving procedures for environmental data collection in electronic formats and its accessibility as open data; • Improving procedures for environmental data flows for regular updating, quality assurance and quality control, reporting, inter-institutional sharing and exchange, online dissemination and other means of dissemination; • Setting up the public participation procedures (from early stages) in the design, use and update of the environmental information system(s) and investigate new sources of information to capture needs and feedback of the public; • Including in the new legislation reference to citizen science or citizen-generated data (crowdsourcing) as a potential tool to collect data, filling the data gaps and complementing existing data sources (invasive species, butterflies, marine litter, air quality); • Include in the new legislation earth observation or other remote sensing tools as to

¹⁹¹ https://zakon.rada.gov.ua/laws/main/v897_323-16?lang=uk

¹⁹² Requested in the national roundtable.



	Measure	Priority	Description
			<p>complement/alternative of the traditional monitoring/reporting and policy evaluation methods</p> <ul style="list-style-type: none"> • Reviewing periodically the application of exceptions in the disclosure of environmental information; • Ensuring the legitimate application of these exceptions and the disclosure of information on emissions in accordance with the Aarhus Convention; • Clarifying the practical rules to separate non-confidential information of public importance for its further disclosure and publishing online; • Establishing or updating as needed mechanisms for assessing the implementation of the existing legislation in this area. <p><i>For guidance, consult the section “Designing an Open Data legal framework and provision of enforcement mechanism” of the Good Practices Report.</i></p> <p><i>This measure is closely linked with “Establish a collaborative institutional framework for the implementation of an open data” in the Cooperation (network) section.</i></p>
	2. Adopt guidelines defining the practical arrangements for environmental information management, sharing and dissemination	High	<p>Adopt technical guidelines set out by the practical arrangements for environmental information management, sharing and dissemination specifying:</p> <ul style="list-style-type: none"> • The scope of environmental information system(s) with their metadata description and registry; • The environmental data management structure (including data architecture, data stewardship, system administration, data privacy, data security and data quality); • Decision-making procedures for sharing non-confidential information and datasets and publishing them online on the relevant portals (e.g. websites of public authorities, environmental portals, one web access point for environmental information, geospatial portals, statistical, open data and other portals); • Separation of non-confidential information as appropriate; • Ensuring stakeholder communication, including public participation procedures in the design, use and update of the environmental information system(s).
	3. Develop and adopt an environmental data policy	High	<p>Adoption of an environmental data policy by the authorities in charge of environmental protection to include:</p>



Measure	Priority	Description
		<ul style="list-style-type: none"> List of varied environmental information available and the scope thereof; Basic terms of availability and accessibility, including open access and data sharing aspects; Data-holder support for availability and accessibility by third parties; Rights and obligations of data and information holders/providers in terms of maintenance, update, quality assurance and reliability of data and information about their responsibility; Licensing terms and conditions; Contact point for access to environmental information. <p><i>To see an example of data policy, consult the European Environment Agency's website: https://www.eea.europa.eu/legal/eea-data-policy/data-policy</i></p>
4. Develop/update licencing terms and conditions to promote open data access, use and reuse of environmental information using an open licence	Medium	<p>This measure will involve defining the licencing terms and conditions used on the different portals for publishing and accessing environmental data.</p> <p><i>At present, the open data portal defines licencing according to CC BY 4.0. However, data and information published by MENR and other public authorities on thematic portals are not licenced, thus the use and reuse of data are limited.</i></p> <p><i>More information about licencing is available in the Good Practices Report in the "Harmonise licencing terms and conditions of environmental data to promote its public use and reuse" section.</i></p>
5. Adopt/update interoperability standards for environmental systems	High	<p>This measure will review the existing standards for exchanging environmental data and information with the aim of standardising these exchanges.</p> <p>Based on the completed inventory, this measure will harmonise the use of standards and develop common guidelines for the automated exchange of environmental data and information.</p> <p>Specifically, these standards will include standards of metadata for data and information exchange between environmental information systems (e.g. interfaces could be built using web services).</p> <p><i>It is important to note that this measure is a prerequisite for building an effective integrated environmental information system.</i></p> <p><i>This measure is closely linked with the measures "Enhance interoperability of geospatial, statistical,</i></p>



Measure	Priority	Description
		<i>health and environmental information systems” and “Establish an electronic registry of public environmental information” in the Infrastructure section.</i>
6. Regular collection and timely reporting of environmental data and information in accordance with national and international obligations	High ¹⁹³	<p>This measure will:</p> <ul style="list-style-type: none"> • Ensure the effective implementation of the Aarhus Convention and its decisions and recommendations from the Meeting of the Parties on promoting effective access to information and electronic information tools. • Include information on the implementation of this roadmap in the national implementation report on the progress (questions) for the Aarhus Convention and Protocol on PRTRs to promote the exchange of experience. • Define practical arrangements for establishing Pollutant Release and Transfer Register within the integrated environment information system(s) by using international standards and good practices. • Improve the ability to trace the origin of data and the methodology behind the production of the indicators as a basis to increase data credibility for policymaking and the general public. • Ensure the implementation of national and international commitments related to the regular provision of environmental data and information. • Ensure constant monitoring and timely preparation of reports on the state of the environment.
7. Improve and make publicly available the quality assurance/quality control mechanisms behind the published environmental data and information	High	<p>The results and methodology used for quality assurance and quality control of environmental data are to be published in a detailed manner in order to enable public and other stakeholders to assess the reliability of the data.</p> <p>This measure will:</p> <ul style="list-style-type: none"> • Assess the current quality control mechanisms along the whole MDIAR¹⁹⁴ chain, PRTR process and others which are similar;

¹⁹³ This action was distinguished as a high priority during the national roundtable.

¹⁹⁴ The monitoring/data/information/assessment/reporting (MDIAR) chain is the flow of data and information from national monitoring to European reporting.



Measure	Priority	Description
		<ul style="list-style-type: none"> • Publish the current control measures in place and set minimum standards to be respected in all stages of the data flow (data collection, data preparation and control, aggregation and data dissemination); • Complete/amend existing legal framework by adding specific provisions on the obligations of quality control of environmental data at different levels (including penalties for non-compliance); • Monitor systematically the implementation of the quality control measures and set up an annual assessment process for the evaluation of the quality of environmental data provided. <p><i>According to the OGP initiatives, the low quality of data is one of the key challenges to be addressed. As described in the report, Ukraine has data quality standards established however it lacks the overall quality control process for the whole data flow.</i></p> <p><i>An example of criteria for assessing quality control measures is depicted in the “Promotion of good practices for national environmental information systems and tools for data harvesting at EU level”, p. 165.</i></p> <p><i>An example of standards, procedures and measures for quality control are also presented in the good practices report, in the “Develop and publish quality control mechanisms for environmental data” section.</i></p>
<p>8. Define/adopt and publish metadata description standards for all environmental data and information in accordance with international standards using a one-stop access point</p>	<p>High</p>	<p>This measure will aim to define metadata standards to support interoperability and dissemination of environmental data and information, including environmental reports and their discoverability. As a result, it will be easier for institutions to exchange and manage environmental data, while also making it easier for the public to find the information.</p> <p><i>Currently, the CKAN/DCAT-AP standard is implemented in the Ukrainian open data portal, but is not in other government software solutions, where datasets are stored for public use. As well as part of metadata standard licencing, metadata should also be implemented at a national level. Currently, in the Ukrainian open data portal, licencing information is not present.</i></p> <p><i>This measure is closely linked with the measure “Enhance interoperability of geospatial, statistical, health and environmental information systems” in the Infrastructure section.</i></p>
<p>9. Expand collection,</p>	<p>High</p>	<p>Ukraine currently publishes most of its data in a</p>



Measure	Priority	Description
		<p>machine-readable format. However, there is still data stored in various public institutions which are not available, hence the need to ensure first their availability/accessibility and preferably in machine-readable formats so that they can be further used and reused.</p> <p>It is recommended that the state of the environment assessment report be regularly produced and made available online as an interactive product, preferably indicator-based. In addition, UNECE indicators should be provided in a timely and consistent manner.</p> <p>This measure aims to ensure the publication of environmental data in a machine-readable format. Such a measure can be driven through the establishment of the Open Data legal framework, setting up the obligation to publish, as a rule, all datasets as machine-readable, unless data are not available in such a format and gradually move to machine-readable formats in case they are currently not available and require extensive processing. <i>The Good Practices Report provides more details about machine-readable formats in the “Transformation of data published to machine-readable format” section.</i></p> <p><i>This measure is closely linked with the “Define/adopt and publish metadata description standards for all environmental data and information in accordance with the international standards using a one-stop access point” measures outlined in the Content section.</i></p>
10. Inventory, re-engineering and publication of public services as e-services	Medium	<p>This measure will define metadata standards and ensure that environmental services are described and accessible through the electronic services portal, in accordance with national standards.</p> <p>This measure will ensure that environmental services are described and accessible through the electronic services portal, in accordance with the national standards. For the description of public services, it is recommended that the European Core Vocabularies, such as Core Public Service, Core Person, Core Location and Core Public Organisation, be adapted. This would allow a coherent and standardised description of e-services and improved interoperability to be ensured.</p> <p><i>Ukraine has made progress during recent years and developed e-services to foster interoperability, especially for open data, environment, geospatial, health, transport, and energy information. Nonetheless, a further development of e-services is</i></p>



Measure	Priority	Description
		<p><i>necessary to integrate 'life events' ('Life events' package government services which are usually provided by multiple government agencies around a subject that is relevant sense to citizens.)</i></p> <p><i>For an example of implementation, consult the Good Practices Report section "Publishing e-services on a dedicated e-service portal". This example shows how the initiative was implemented in the Republic of Moldova.</i></p>
<p>11. Perform an open data impact analysis for the use/reuse of environment data</p>	<p>Medium</p>	<p>This measure will support raising awareness through the regular assessment of the impact of the use/reuse of environmental data, as part of the open data impact assessment framework, and will drive further developments. For example, performance can be evaluated against the following criteria:</p> <ul style="list-style-type: none"> • Number of environmental datasets downloaded and reused; • User feedback received/collected; • Number of applications developed using environmental data and having an impact on the environment (including reuse of environmental data by other sectors, such as transport). <p><i>More information about the general open data impact assessment can be found in the Good Practices Report in the "European Data Portal Impact maturity" section. The section provides an example of the European Open Data Portal relevant for this area.</i></p> <p><i>This measure is closely linked with the "Strengthening of technical capacity for environmental monitoring" measure in the Infrastructure section.</i></p>

In order to facilitate the implementation of the provided measures, the good practices report provides the following examples and recommendations:

- Building a digital strategy which includes the environment (example from Lithuania);
- Building e-services and public information systems according to national and international standards (examples from Estonia and the EU);
- Publishing e-services on a dedicated e-service portal (examples from Lithuania, Romania and the UK);
- Develop a national strategy for open data and a measure plan to implement it for specific types of information (example from Ireland);
- Adopt a measure plan/implementation plan based on the open data strategy and the digital strategy (example from the OGP);
- Adopt an open data policy, and extend it to environmental data (example from the EU);
- Designing an open data legal framework and provision of enforcement mechanisms (example from the EU);



- Definition of metadata description standard for all environmental information (examples from the EU and the UK);
- Transformation of data published to machine-readable format;
- Develop and publish quality control mechanisms for environmental data (example from the European Open Data Portal);
- Adopt/update licencing terms and conditions of environmental data to promote its public use and reuse (example from the European Open Data Portal);
- Evaluate the impact of open data (examples from the European Open Data Portal);
- Improve accessibility and use of available environmental data and information by improving the multilingual aspect of portals (example from the EEA).

5.2.2 Roadmap measures: Infrastructure

The measures proposed to Ukraine in support of the SEIS pillar “Infrastructure” are presented in the table below.

Table 20. Measures related to SEIS pillar: Infrastructure

Measure	Priority	Description
12. Establish a single and user-friendly web access point for environmental information	High	<p>To support the implementation of Decision VI/1 of the Meeting of the Parties of the Aarhus Convention, it is recommended that a single web access point to environmental information be established.</p> <p>In this regard, Ukraine developed an Open Environment concept to integrate the environmental data held by central and local governmental bodies into one system served by a single portal. The following suggestions are aimed at assisting the development of the proposed portal:</p> <ul style="list-style-type: none"> • The portal should be designed so that agencies and institutions can share easily their (structured) data via application programming interfaces or APIs (e.g. EEA public map services¹⁹⁵ or provisions of the INSPIRE Directive). The portal should have a tool for checking the quality of metadata provided by data providers; • The portal could be automatically synchronised with other “data publication” portals such as the Open Data Portal (e.g. publish open data according to Data Catalogue Vocabulary – DCAT on all portals containing and disseminating environmental data); • The portal should have a developed search

¹⁹⁵ <https://www.eea.europa.eu/code/gis>



Measure	Priority	Description
		<p>functionality to allow the user to use multiple field search and filter options (e.g. file format) to refine the search, combining the keywords with classifiers;</p> <ul style="list-style-type: none"> • The portal should be user-friendly and – if needed – have an integrated content management system¹⁹⁶; • The portal should be maintained/updated and enhanced taking into consideration the feedback received (from the public, governmental bodies and other users). <p><i>Environmental information and data are spread on multiple portals, as shown in this report. It is not clear which website has the latest or correct information published. The portals are also built according to different designs, which hinders the searchability of information.</i></p> <p><i>More information about single access points can be found in the Good Practices Report in the “Establish a single and user-friendly web access point for environmental information” section (examples from the EU, EEA and Ireland).</i></p> <p><i>The design of the environmental information system is also widely described in the document “Promotion of good practices for national environmental information systems and tools for data harvesting at EU level”.</i></p>
13. Enhance interoperability of geospatial, statistical, health and environmental information systems	High	<p>This measure will facilitate the implementation of the interoperability standards defined for the environment and other thematic data. This measure will:</p> <ul style="list-style-type: none"> • Assess existing compatibility of various information systems with defined interoperability standards, in particular with the geoportal; • Adopt/update and implement standards for metadata and data interoperability in accordance with international standards and good practices; • Implement the standards defined and develop APIs for all external users; • Provide automated mechanisms for sharing time-

¹⁹⁶ The UK provides a series of good practices for developing a management system for environmental permits. These good practices can be considered when introducing a content management system for the environment, including standards such as (for example) Eco-management and Audit Scheme (EMAS), EMAS Easy, ISO 14001, Green Dragon, phases 1 to 5 of British Standard (BS) 8555. Link: <https://www.gov.uk/guidance/develop-a-management-system-environmental-permits>



Measure	Priority	Description
		<p>series data.</p> <p>The “Trembita” information system is used as an interoperability platform in Ukraine. It will be useful that, even from the design and development stages of the information system, public institutions implement common interoperability standards and integrate their electronic resources with the “Trembita” information system.</p> <p>These actions can also be included in the national interoperability framework.</p> <p><i>Refer to the good practices report for more details about the development of interoperability in Lithuania and the EU in the “Establishing an interoperability framework” section.</i></p> <p><i>This measure is linked with the measures “Develop and/or continue to enhance an integrated system for environmental information management in accordance with the Aarhus Convention and the Protocol on PRTRs” and “Update/adopt interoperability standards for environmental systems and establishment of norms regarding inter-institutional data flow exchange/sharing, its format and improvement of the management of data collected” from the present roadmap.</i></p>
14. Establish an electronic registry of public environmental information	High	<p>This measure aims to establish a registry of environmental information and data available in each institution and system (i.e. the metadata management system), as well as data that is publishable taking into consideration the existing legal framework. The registry will be used by civil servants to support the continuous development and improvement of environmental information systems and the dissemination of environmental information. Specifically, the registry will map the systems, databases, institutions responsible, datasets and reports published/available.</p> <p>This measure could be coupled with the standardisation of metadata for environmental information and with the development of a single web access point for environmental information, which would be automatically refreshed based on the registry of environmental information.</p> <p><i>Ukraine is currently developing an Open Environment platform. This measure would support the ongoing initiatives.</i></p> <p><i>The inventory of environmental information systems is</i></p>



Measure	Priority	Description
		widely described in the document "Promotion of good practices for national environmental information systems and tools for data harvesting at EU level", in the section "Inventory of the environmental information system", p. 25.
15. Improve accessibility and usability of available environmental data and information by improving the multilingual aspect	Medium	<p>This measure recommends a comprehensive translation and regular update into Ukrainian/English of the websites of public institutions, key reports and environmental information metadata.</p> <p><i>An example of a multilingual portal is the EEA GEMET ¹⁹⁷, which provides a thesaurus of environmental terms, currently translated into 37 languages.</i></p>
16. Develop e-services for the environment	Medium	<p>At present, few e-services are available for the environment.</p> <p>This initiative will aim to develop environmental e-services according to the national standards (service passports) and service interoperability standards (e.g. e-signature, e-payment).</p> <p><i>More information about the description of public services can be found in the Good Practices Report in the "Building e-services and public information systems according to national and international standards" section.</i></p> <p><i>This measure is connected to the measure "Inventory, re-engineering and publication of public services as e-services" from the present roadmap.</i></p>
17. Strengthen the technical capability for environmental monitoring	Continuous	<p>This measure aims to strengthen the technical capability for environmental monitoring to thematic areas, for example water.</p> <p>In this context, the gradual provision of modernised monitoring equipment should be foreseen, planned and budgeted. To do so, the following is recommended:</p> <ul style="list-style-type: none"> Assess the current monitoring infrastructure for selected thematic areas (e.g. water, air as a start). This can be achieved through the establishment of a cross-thematic team of experts that could evaluate the existing infrastructure against reporting requirements and provide a complete assessment of the needs.

¹⁹⁷ <https://www.eionet.europa.eu/gemet/en/concept/4438>



Measure	Priority	Description
		<ul style="list-style-type: none"> • Define priorities for monitoring as part of the national monitoring system based on national needs and international commitments. • Define specific monitoring requirements for each thematic area. These objectives should include: <ul style="list-style-type: none"> ○ Frequency of observation (e.g. hourly, daily, monthly or yearly); ○ The granularity of data gathered (accuracy); ○ Space coverage (taking into consideration the spatial requirements – urban vs rural areas, industrial areas); ○ Quality of data; ○ Compatibility with existing equipment and information systems and, where possible, compliance with EU requirements as part of the approximation process. • Develop a long-term and realistic programme for acquisition and replacement of the existing infrastructure, taking into consideration the financial possibilities and other possible options. • If possible, develop public-private partnerships and establish a public framework for combining data collected by the public in this process. In Ukraine, for example, the public has developed a system that integrates data from privately-owned air monitoring equipment. Any person can buy a device and connect to it. This could eventually be extended to other areas. • Follow up by adopting a detailed and stepwise implementation plan for gradually replacing equipment and putting the new equipment into the existing system (taking into consideration available financial resources and national priorities). This point is crucial as lack of integration could: 1) render the exchange of data cumbersome, 2) increase the need for human resources and 3) undermine the quality and availability of data; • Identify potential environmental areas which could gradually be used to complement the traditional environmental monitoring system with additional information coming from other sources (e.g. citizen science, earth observation). <p>The acquisition of monitoring equipment requires consequent investments and should be well prioritised, bearing in mind the national needs, a long-term perspective and the approximation of the respective EU legislation.</p>



Measure	Priority	Description
		<i>This measure is linked with the measures “Develop and/or continue to enhance an integrated system for the management of environmental information in accordance with the Aarhus Convention and the Protocol on PRTRs” from the present roadmap.</i>
18. Develop and/or continue to enhance an integrated system for the management of environmental information in accordance with the Aarhus Convention and the Protocol on PRTRs	Medium	<p>This measure recommends the development of an integrated environmental management system, which will ensure the coordinated management and exchange of environmental data and information. To do so, this measure recommends:</p> <ul style="list-style-type: none"> • Producing an inventory of all systems available and used for the management of environmental data and information at the national level; • Defining requirements for an integrated but distributed system for environmental information management. In particular, the system will provide functionalities, such as: <ul style="list-style-type: none"> ○ Workflow (e.g. quality management); ○ Environmental data collection; ○ Automatic dissemination and updating of open data; ○ Document management; ○ Integration with external systems (statistical, health, open data, transport, energy, cadastral, etc. as needed); ○ Advanced visualisation tools and capabilities for integration with business intelligence tools; • Gradual implementation of the system; • Training of potential users and institutions involved on the benefits, functionalities and usability of the integrated system; • Regular assessment of the performance and update of the system when needed. <p>This measure will foresee the development of an efficient integrated system by connecting various existing environmental information systems.</p> <p><i>The document “Promotion of good practices for national environmental information systems and tools for data harvesting at EU level” presents guidelines for the development of environmental information systems.</i></p> <p><i>This measure is linked to the measures “Enhance Interoperability of geospatial, statistical, health and environmental information systems” from the present roadmap.</i></p>
19. Develop applications to	Low	This measure aims to develop a series of software



Measure	Priority	Description
engage the public in environmental monitoring and protection activities		<p>applications (e.g. mobile apps) that will expand the potential for e-government to create an “environmental data ecosystem” and enable the public to access, consult and interact with environmental data.</p> <p>For instance, through apps the public can:</p> <ul style="list-style-type: none"> • access and consult environmental information in real-time according to their location; • report poaching, and identify and signal polluted areas, etc.; • report poaching, and mark and signal polluted areas, etc.; • participate in environmentally-friendly events in their neighbourhood; • integrate environmental data they have collected with government apps, where possible; • use crowdsourcing (citizen-generated data) to capture environment monitoring data throughout the territory of Ukraine. <p><i>This measure is linked with the measures proposed in the Cooperation (network) section in the present roadmap.</i></p>

In order to facilitate the implementation of the provided measures, the good practices report provides the following examples and recommendations:

- Establishing an interoperability framework (examples from the EU and Lithuania);
- Building an Open Data Portal and foster publication of public sector information (examples from Ireland, the Netherlands and Spain);
- Establishing a single and user-friendly web access point for environmental information (examples from Ireland and the EEA);
- Developing infrastructure on the most advanced platforms based on geospatial data and GIS technologies (examples from the EU and Lithuania);
- Providing technological support for sharing environmental data at the regional level.

5.2.3 Roadmap measures: Cooperation (Network)

The measures proposed to Ukraine for the SEIS pillar “Cooperation” are presented in the table below.

Table 21. Measures related to SEIS pillar: Cooperation

Measure	Priority	Description
20. Establish a collaborative institutional framework for the implementation of open data	High	<p>This measure will strengthen the necessary institutional framework for managing open data, especially in relation to the environmental component.</p> <p>This measure will focus on the need to create strong</p>



Measure	Priority	Description
		<p>cooperation between institutions to ensure the exchange, sharing, reuse and publication of public sector information (PSI).</p> <p>An example of an approach to establishing a collaborative institutional framework for open data involves:</p> <ul style="list-style-type: none"> • Amendment/supplementation of the existing legal framework to foresee clear responsibilities of the various actors and ensure the clear division of responsibilities for open data at national and thematic levels (e.g. there should be general rules for governing the open data framework and specific rules for individual environmental data providers on how to organise an open data publishing process internally); • Establishment of a cross-sectoral working group which will assist/support and facilitate in the establishment of the operational mechanisms of collaboration (i.e. processes, procedures and good practices); • Organisation of events/fora/regular dialogues to foster collaboration between national stakeholders and various data users. <p><i>During a national roundtable in Ukraine, the cross-sectoral collaboration was identified as one of the key areas for successful implementation of an open data concept.</i></p> <p><i>The good practices report provides examples of initiatives undertaken in the EU to foster inter-institutional and international cooperation in the field of open data. The open data maturity report 2019 provides criteria to assess the maturity of the institutional framework in a country. The document "Development of an assessment framework on environmental governance in the EU Member States" also provides good practices to establish an institutional framework for environmental governance.</i></p> <p><i>This measure is linked with the recommendations presented in the Content section of the present roadmap and the targeting of the revision of the legal framework.</i></p>
21. Develop and ensure increased capacity for handling environmental and open data	High	<p>Components of this measure cover:</p> <ul style="list-style-type: none"> • Assessment of the capacities needed (human and financial resources and tools) for managing and making available environmental data and information at national and local levels;



Measure	Priority	Description
		<ul style="list-style-type: none"> • Allocation of necessary resources in the national and local budgets (annual estimates and allocations) based on the planned activities; • Recruitment of specialised staff and acquisition of necessary tools; • Development and integration of procedures and processes for preparing and disseminating environmental data and information; • Professional development/training plans for civil servants and/or data stewards or data officers. In this regard, it is necessary to develop official training programmes (mandatory) for staff in charge of data management and to recognise these training programmes through certificates. <p><i>During the national roundtable in Ukraine, it was highlighted that this measure should be set as a high priority because a lack of capacity and appropriate skills were indicated as one of the main issues.</i></p> <p><i>The document “Development of an assessment framework on environmental governance in the EU Member States” provides multiple examples of initiatives undertaken to build capacity in this area. The section “2. Administrative capacity (environmental inspectorates, police, customs, prosecution services and audit bodies)” focuses strongly on the example of capacity-building in the EU.</i></p> <p><i>This measure is linked with the measures “Strengthen the technical capability for environmental monitoring” and “Develop and/or continue to enhance an integrated system for the management of environmental information in accordance with the Aarhus Convention and the Protocol on PRTRs” of the present roadmap.</i></p>
22. Promote international and regional cooperation to facilitate the implementation of the roadmap	High	<p>This measure aims to support Ukraine with international expertise and good practices to assist in the implementation of the present roadmap. To do so, it is recommended that:</p> <ul style="list-style-type: none"> • Fora and other platforms where experience can be shared be identified; • Contacts with key stakeholders at the regional and international level be established to share experience and good practices; • An inventory of international and regional initiatives be built, and their potential assessed. <p><i>The good practices report provides examples of initiatives that can be undertaken to implement this measure, in the section “Increasing public administration, public and business awareness over</i></p>



Measure	Priority	Description
		<i>open data and environmental data”.</i>
23. Raise awareness of open government and open data for the environment among citizens and economic operators	Continuous	<p>This measure will increase the demand for open government and open data by raising awareness and conducting other promotional campaigns at national and local levels.</p> <p>This measure will focus on raising public awareness of the role and impact of environmental information, its accessibility, usability and other related aspects, by pursuing ongoing activities and strengthening and expanding them where and when appropriate.</p> <p>Additionally, a series of activities for promoting the use/reuse and sharing of environmental information could be undertaken, such as:</p> <ul style="list-style-type: none"> • Hackathons; • Fora; • Promotion campaigns; • Development of incubators; • Development of public-private partnerships; • Facilitating dialogue and cooperation between national bodies, NGOs and the academic community. <p><i>The good practices report provides examples of initiatives that can be undertaken to implement this measure, in the “Increasing public administration, citizens and business awareness over open data and environmental data” section.</i></p>

In order to facilitate the implementation of the provided measures, the good practices report provides examples and recommendations on the following topics:

- Increasing awareness and motivation among public institutions over e-government and digital solutions (example from the EU);
- Increasing awareness of e-government among the public and businesses (example from the EU);
- Coordinating open data initiative(s) (example from Ireland);
- Establishing processes and procedures for managing open data (example from Lithuania);
- Increasing public administration, public and business awareness of open data and environmental data (example from Belgium, Cyprus, the EU, Italy and Luxembourg);
- Promoting open data to organisations;
- Collecting user feedback and providing new means of communication between open data providers and users (example from Spain).

