

Dissemination of environmental information

Draft country maturity report: Ukraine

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Note

The current draft report was built on publicly available information up to October 2018. This draft version will be reviewed during the year 2019. It is not intended 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.

This report contains information obtained or derived from a variety of publicly available sources described within the report in more detail.

This draft report was produced by PricewaterhouseCoopers as part of the 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 ENI SEIS II East project 2016-2020.

It is expected that during the 2019 the draft report will be reviewed by the national authorities involved in the environmental information management and use at national level and enriched with more specific, up to date information available.

List of acronyms

Term	Definition
CEPA	Comprehensive and Enhanced Partnership Agreement
CIT	Communication and Information Technologies
EaP	Eastern Partnership
EGDI	E-Government Development Index
EIA	Environmental Impact Assessment
EITI	Extractive Industries Transparency Initiative
EMIC	Environment Monitoring and Information Centre
EPA	Environmental Public Alliance
EPI	Environmental Performance Index
EU	European Union
GODI	Global Open Data Index
GRE	Gamma Radiation Exposure
IAC	Information Analytical Centre
MENR	Ministry of Ecology and Natural Resources
NES	National Environment Strategy
NGO	Non-Government Organisation
NIS	National Institute of Standards
ODIN	Open Data Inventory
OGP	Open Government Partnership
OSA	Oblast State Administrations
OSI	Online Service Index
PRTR	Pollutant Release and Transfer Register
REC	Regional Environmental Centre
RLC	Reference Laboratory Centre
SEI	State Ecological Inspectorate
SEIS	Shared Environmental Information System
SEMS	State Environment Monitoring System
SGB	Self-Governmental Bodies
SNCO	State Non-Commercial Organisation

1 Executive summary

Ukraine faces several challenges, not only in environment, but also in the fields of e-governance and open data. In this regard, it is to be acknowledged that Ukraine has made a lot of progress in each of these areas, which are reflected in clear progress in related international rankings¹. Ukraine is now ranked 82th in the world E-government Development Index (EGDI, 2018), and ranked 74th according to the Open Data Inventory (ODIN) score (2017). In terms of ICT statistics, Ukraine has now around 59% of Households with Internet access at home². It is to be noted that some EaP countries, such as Armenia, Georgia and the Republic of Moldova, could reach 80% of Households with Internet access at home within few years.

As such, since its independence in 1991, Ukraine has made a long way, building steadily on the development of a comprehensive regulatory framework addressing key challenges in the field of e-government, open data and the environment. To support these initiatives, Ukraine also signed international agreements such as the Aarhus Convention and its Protocol on Pollutant Release and Transfer Registers and became an active member of such initiatives as the Open Government Partnership, the Extractive Industries Transparency Initiative, and the Declaration on Cooperation on Environment and Climate Change in Eastern Partnership Countries. A key challenge for Ukraine is now to leverage on e-government and Open Data initiatives and to foster collaboration between environmental information holders to improve environmental information sharing and dissemination.

E-government and Open Data

Briefly, the Ukrainian e-government story started in 1992 with the Law about information, and the Law “on national program of Informatisation”, both last amended in 2016. Ukraine also passed multiple Laws to strengthen the legal framework around e-government, open data and the environment. To drive e-government and open data initiatives, the State Agency for E-Governance of Ukraine was created on 1 October 2014.

A major step was the establishment of the Digital agenda for Ukraine in 2017, stating the main goals for 2020. Its main components are based on the EU Digital strategy and EU digital single market initiatives. The establishment of the first public e-government portal initiative (igov.org.ua) started officially in 2015, run by volunteers. Later, the official e-services portal³ was opened. In May 2018, the Cabinet of Ministers Ukraine issued the Regulation #357 about organisation of digital exchange between government informational resources, shaping the foundation for public institutions interoperability. Finally, August 2018 saw the opening of the new Open Data portal (<https://data.gov.ua/>) of Ukraine, which now hosts over 32000 datasets, but less than 50 for the environment. As such, Ukraine is ahead of most EaP countries in terms of Open Data datasets availability. Its portal is user friendly and based on CKAN⁴. Metadata are nonetheless still not publicly available, which could undermine the economic potential of open data. Besides, the portal hosts very few environmental data, showing a need for initiatives aiming to foster supply and demand of public information.

¹ We refer here to the indicators described in the section « International rankings » of the present report and related to e-government and Open Data.

² <https://www.itu.int/net4/itu-d/icteye/CountryProfileReport.aspx?countryID=241>

³ <http://poslugy.gov.ua/>

⁴ The Comprehensive Knowledge Archive Network is a web-based open-source management system for the storage and distribution of open data.

Environmental information

Ukraine became a Party to major international environment conventions⁵, including the Aarhus Convention and the Protocol on PRTRs, and established the Ministry of Ecology and Natural Resources and several agencies with environmental protection responsibilities. The environmental governance was adapted in regards of the decentralisation reform of 2010 and resulted in the abolishment of the regional department of the Ministry of Ecology and Natural Resources. For fostering the coordination and collaboration on environmental monitoring between all stakeholders, in 2001 the Interagency Commission on Environmental Monitoring was established. In 2010, the Commission was liquidated and replaced by bilateral agreements with other ministries and agencies. In addition, Ukraine developed a series of environmental management instruments; and established environment and nature protection funds.

The monitoring of environment is done through individual systems which are part of the State Environment Monitoring System. National entities exchange information based on the bilateral agreements signed with the Ministry of Ecology and Natural Resources. Organisational integration of subjects of environment monitoring at all levels is performed by the Ministry of Environment and its regional bodies. All received data are submitted to Information and Analytical Centre of the Ministry of Environment and archived in the ecological database. Monthly or quarterly reporting is distributed by the Ministry of Ecology and Natural Resources to interested parties.

Now, environmental information is still published on different portals without metadata description, which can create confusion. Environmental data are published on the Statistical Office website, but there is mechanism to compare environmental data between each other, neither to compare them overtime. In addition, Ukraine has several geoportals hosting environmental data, but a central geoportal with all environmental data available and a possibility to compare them overtime would bring clarity to the public. Last, most websites and reports are still not available in English, which might undermine international collaboration.

Main challenges

Ukraine still faces a series of challenges to improve its environment information monitoring, sharing and dissemination. The decentralisation reform and the re-attribution of responsibilities to Oblast State Administrations' entities has diminished the efficiency of the established governance. Indeed, the split of responsibilities was made without adapting all procedures nor providing adequate resources and tools. According to the World Bank environment country analysis⁶, these elements combined jeopardise the efficiency of environment monitoring.

Besides, the supporting IT landscape in Ukraine for managing environment information monitoring, sharing and dissemination is based on the State Environment Monitoring System and local systems. This sparse IT landscape increases the complexity of the overall architecture, interfaces, standards and procedures. Public authorities in Ukraine publish their environmental data on multiple platforms such as State Environment Monitoring System, Open Data portal, or their own website, which are all in Ukrainian. The same is also true for e-government platforms, where e-services can be found at multiple places. It is therefore not clear for citizens, businesses and/or NGOs where to find the information, what public authority is responsible for maintaining and updating the data and for international organisations, it is even more difficult.

⁵ Ukraine ratified the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention), on 18 November 1999. Ukraine also ratified the Protocol on Pollutant Release and Transfer Registers to the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters on 2nd May 2016.

⁶ <http://documents.worldbank.org/curated/en/327881470142199866/AUS16696-WP-OUO-9-Ukraine-CEA-has-been-approved-P151337.docx>

Finally, the national environment strategy⁷ lacks a clear prioritisation among the different environmental goals, a clear baseline and realistic target indicators, clear time frames in the national plans of measures. This means that most initiatives stated in the strategy will be difficult to implement, and to embed more broadly in the digital agenda. Ukraine is now drafting a new national environmental strategy. The draft represents a sound approach to strategic planning around information, open data and communications.

⁷ <http://www.greenmind.com.ua/images/meropriyatiya/ocenka-vupolneniya-strategii-i-npd.pdf>

2 Environmental information readiness

2.1 E-government, Open Data and environmental information legal policy and institutional framework

This section contains a summary of the national documents on legal acts, policy and institutional framework in terms of e-government, open data and environmental information.

2.1.1 National policy and legal framework

2.1.1.1 E-government

This section presents the main Laws and strategic documents driving e-government in Ukraine.

On National Program of Informatisation⁸

In 1998, the Ukrainian parliament adopted the Law “On National Program of Informatisation” that consisted of some important theoretical concepts and definitions. The Law also contained procedural norms about the program of Informatisation of local authorities and some functions of public bodies, and finally addresses the financial side of its implementation.

Law of Ukraine about electronic documents and electronic documents flow⁹

This Law was passed in 2003 and amended in 2015. This Law establishes the main organisational and legal bases of electronic document management and use of electronic documents.

Digital agenda for Ukraine - 2020¹⁰

The Digital agenda was developed in 2017. This document outlines the principles of Ukraine’s development in the digital space and the basis for the development of the digital economy. The digital strategy doesn’t specific concrete environmental information/data sharing goals.

Main pillars of Ukraine Digital agenda are:

- *Telecom and ICT infrastructure*, focusing on the creation of national broadband plan, the increase of BB penetration, the development of cloud infrastructure and the harmonization of the scope of laws and directives with EU
- *Digital skills*, focusing on the implementation of re-education program, the creation of open digital university, the digitalization of schools, the development of pilot smart living projects and the popularization 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 e-services and improving the efficiency of state governance
- *Innovations and R&D*, focusing on improving business climate for R&D, creating the science office, encouraging venture financing and ensuring the enforcement of intellectual property rights
- *Trust and cybersecurity*, focusing on developing national cybersecurity, ensuring network and information security, increasing awareness and ensuring online safety
- *Benefits from ICT for society and economy*, focusing on developing smart city, implementing eHealth solutions and setting safeguards online

⁸ <http://zakon.rada.gov.ua/Laws/show/en/74/98-%D0%B2%D1%80>

⁹ <http://zakon.rada.gov.ua/Laws/show/en/851-15>

¹⁰ http://www.e-ukraine.org.ua/media/Lviv_Minich_2.pdf

Law of Ukraine “On administrative assistance services”.

This Law covers the legal rights, freedoms and legitimate interests of public and legal entities in the field of administrative services. The Decree of the Government of Ukraine of the 3rd September 2013, p.13, stated the requirements for a single state portal of the administrative services. The national e-services portal <http://poslugy.gov.ua> was initiated by this Law.

2.1.1.2 Open Data

Law of Ukraine about information¹¹

The Law was passed in 1992; the last amendment was made in 2016. This Law provides the right for anyone living in Ukraine to access information. It sets forth the legal principles of activities in the information sphere, and governs the relations concerning creation, collection, obtaining, storage, use, distribution, protection, and information protection.

Law on Access to Public Information¹²

The Law was passed in 2011 and refers to the right of access to information held by public bodies - also known as "right to know". The purpose of the Law of Ukraine "On access to public information" is to ensure transparency and openness of public authorities and to create mechanisms for ensuring the right of everyone to access to public information.

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. These steps were the Law No. 319-VIII (“Amendments to Some Laws of Ukraine on Access to Public Information in the Form of Open Data”) and Law No. 313-19 (“Access to Information on Budget Figures in the Form of Open Data”). 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 Web sites and on the national open data web platform at data.gov.ua. Additional Regulation is needed however to specify the types of data that will be public (Kyiv Post, 2015).

In October 2015, the Parliament passed amendments to the Law, aimed to simplify access to public data with a focus on open data. To support the amendments, the Cabinet of Ministers of Ukraine adopted the Decree #835¹³, which required a list of more than 300 datasets to be opened specifying the means of opening and a list of responsible bodies. As of December 2017, 93% of these datasets have been published¹⁴.

The list included several datasets related to the environment from such institutions as Ministry of Health, Ministry of Energy and Coal, Ministry of Ecology and Natural Resources, State Service of Geology and Subsoil, State Water Agency, Ministry of Agrarian Policy and Food, State Agency of Forestry, Agency of Fisheries, State Service of Geodesy, Cartography and Cadastre and State Statistics Service of Ukraine. The full list of datasets published by these institutions is provided in Appendix I.

CMU resolution #357 Some questions of the organisation of electronic interaction of the state electronic information resources¹⁵

In May 2018, the Cabinet of Ministers Ukraine issued the Regulation #357 about the organisation of digital exchange between government information resources. The Regulation prescribes an order of data exchange between high-priority registers (connection agreement templates, data exchange formats, etc.).

¹¹ <https://cedem.org.ua/en/library/on-amending-the-Law-of-ukraine-on-information/>

¹² <https://cedem.org.ua/en/library/Law-on-access-to-public-information/>

¹³ <http://zakon3.rada.gov.ua/Laws/show/835-2015-%D0%BF>

¹⁴ Economic potential of open, data for Ukraine, 2018, Kyiv School of Economics.

¹⁵ <http://zakon.rada.gov.ua/Laws/show/en/357-2018-%D0%BF>

The Order is applicable to any resources containing environmental information. However, only today State entities can dispose of data from governmental assets listed in the National Register of electronic information resources - available only in Ukrainian language (<https://e-resurs.gov.ua/>). In practice, the dispositive put in place is not working, and does not include metadata about all informational resources. Besides, it did not solve the problem of duplication of other existing resources, including non-governmental.

2.1.1.3 Environmental information

The Ukrainian environmental legislation counts more than 300 Laws and covers most areas of environmental protection and natural resources management. The main Laws around environment:

- Law of Ukraine "On State Statistics"
- Land Code of Ukraine
- Forest Code of Ukraine
- Water Code of Ukraine
- The Code of Ukraine on Bowels
- Law of Ukraine "On Ecological Network"
- Law of Ukraine "On Ecological Audit"
- Law of Ukraine "On Ecological Examination"
- Law of Ukraine "On Air Protection"
- Law of Ukraine "On Nature Reserve Fund"
- Law of Ukraine "On Flora"
- Law of Ukraine "On Fauna"
- Law of Ukraine "On Waste"
- Law of Ukraine "On Drinking Water and Drinking Water Supply"
- Law of Ukraine "On the State Program for Adaptation of Ukrainian Legislation to the Legislation of the European Union";
- Provisions of CMU "On Electronic Interaction of State Electronic Information Resources"
- Concept of Development the Electronic Services System in Ukraine
- Concept of creation the national automated system "Open environment"
- Concept of reforming the system of state supervision (control) in the field of environmental protection
- Law of Ukraine "On Access to Public Information"
- The procedure for involving the public in the discussion of decision-making issues that may affect the state of the environment
- Resolution of CMU "On approval of the medium-term plan of the Government's priority actions by 2020"

Nonetheless, the environmental legislation faces several weaknesses:

- The environmental legislation is largely declaratory in nature and does not have all the essential enforcement mechanisms for the implementation of legal acts and international agreements;
- Many of the acts are not coordinated with each other;
- Legislation undergoes limited analysis of its impact.

In that sense, the study "Implementation of environmental commitments in the context of deregulation in the European Union: experience of best practices for Ukraine, analytical Paper from Resource and Analytical Centre "Society and Environment", 2017" states¹⁶ the need to improve the level of practical application of environmental legislation in Ukraine. Many of the current normative legal acts of Ukraine do not work, and there are no mechanisms for improving the level of implementation. Ukraine does not have systemic mechanisms or instruments aimed at improving the application of legislation or policies. Finally, it justifies this situation by the level of corruption of the judicial system.

¹⁶ <http://www.rac.org.ua/vydannya/analychny-dokumenty/implementatsiya-ekologichnykh-zobovyzan-v-umovakh-deregulyatsiyi-v-evropeyskomu-soyuzi-dosvid-kraschykh-praktyk-dlya-ukrayiny-analychnyy-dokument-2017>

Law of Ukraine "On Environmental Protection" (Articles 20, 22)¹⁷

The Law of Ukraine "On Environmental Protection" (Articles 20, 22) provides for the establishment of State Environment Monitoring System (SEMS) and monitoring the state of the environment and the level of its pollution. These functions entrusted to the Ministry of Environment and Natural Resources and other central executive authorities, who are the subjects of the state environment monitoring system, as well as enterprises, institutions and organisations whose operations cause or may cause environmental degradation. Further Regulations define the objects monitored (environmental data) in Ukraine:

- Resolution of the Cabinet of Ministers of Ukraine of 09.03.1999 № 343 "On Approval of the Procedure for Organisation and Monitoring in the Field of Air Protection"
- Resolution of the Cabinet of Ministers of Ukraine of 19.09.2018 № 758 "On Approval of the Procedure for State Monitoring of Water"
- Resolution of the Cabinet of Ministers of Ukraine of 20.08.1993 № 661 "On Approval of the Regulation on Land Monitoring"
- Resolution of the Cabinet of Ministers of Ukraine of 26.02.2004 № 51 " On Approval of the Regulation on Monitoring of Soil on Agricultural Land."
- Resolution of the Cabinet of Ministers of Ukraine of 17.11.2001 № 1551. "On coordination of activities between the ministries and agencies, identification of main principles of state policy on the development of environmental monitoring system, and ensuring its operation based on a single regulatory and methodological support

Law of Ukraine "On State Statistics" (Articles 14, 22, 24, 25)

The Law of Ukraine "On State Statistics" regulates the main tasks of state statistics bodies:

- Ensuring accessibility, transparency and openness statistical information, its sources and methodology of compilation
- Provide even access to statistical information legal entities and individuals
- Provide statistics to international organizations as well to exchange statistical information with statistical information services of other countries in accordance with the requirements of the legislation of Ukraine

The Law, among other, determines:

- The procedure and conditions for access to statistical information;
- International cooperation in the field of statistics is directed on informational cooperation with international statistical organizations and statistical services of other countries on statistical methodology and practice, as well to exchange experience and information
- Primary data received by the state statistics from respondents within the state statistical surveys, observations of the environment, in particular land, water, air, plant and animal of the world, factors that affect or may affect the condition of environment and human health, are the open data

Land Code of Ukraine

Land Code of Ukraine regulates the land relations. Among others it provides the procedure for monitoring land with a view to forecasting the ecological and economic consequences of land degradation to prevent or eliminate the effects of negative processes. In the land monitoring system, collecting, processing, sharing, and dissemination and analysing land status information, forecasting their changes, and developing scientifically sound recommendations for decision-making on preventing negative changes in land status and adhering to environmental safety requirements are carried out.

Moreover, the Code regulates general principles of creation and maintenance of the State land cadastre (available only in Ukrainian), which is intended to provide the necessary information of state authorities and

¹⁷ These Laws are referend by the MENR website: <http://eng.menr.gov.ua/index.php/monitoring>

local self-government bodies, interested enterprises, institutions and organizations, as well as citizens to control the use and protection of land, economic and environmental justification of business plans and land management projects.

As well sectoral legislation, that regulate accessibility of environmental information, in general regulate relations to provide the preservation of the natural environment, reproduction of natural resources, ensuring environmental safety and prevention of harmful influence, determine the basis for the implementation of state statistical activities to obtain comprehensive and objective statistical information and providing it to the state and society.

Law on Environmental Impact Assessment¹⁸

The Law on EIA has established an EIA register, an important on-line tool for access to environmental information about specific planned activities. While technical design needs to be improved, it is a very good instrument.

Order of the Ministry of Environment of Ukraine on Environment Monitoring¹⁹

These orders shape the landscape of environment monitoring in Ukraine:

№	Title of the document	Number	Date of approval
1	"Integrated interagency guidance on organisation and implementation of state monitoring of water"	485	24.12.2001
2	"Methodological guidelines for preparation of regional and national environment monitoring program"	487	24.12.2001
3	"Regulations on information exchange between the Ministry of Environment of Ukraine and other subjects of the environment monitoring system in the process of routine observations of the environment" (KND 211.0.1.101-02)	323	21.08.2002
4	"Guidelines for the comparison of water monitoring data" (RD 211.1.8.103-2002)	325	21.08.2002
5	"Methodological guidelines for the inventory of analytical control laboratories" (RD 211.0.7.104-02)	325	21.08.2002
6	"Methodological guidelines and requirements for equipping typical on-line water control items" (RD 211.1.7.105-02)	325	21.08.2002
7	"Nomenclature and designation of the structural elements of the State Environment Monitoring System" (KND 211.0.6.102-02)	324	21.08.2002
8	"Organisation and carrying out observations of the pollution of surface water (within the system of Ministry of Natural Resources)" (KND 211.1.1.106-2003)	89-M	04.06.2003
9	"Methodological guidelines on establishment of environment monitoring system at regional level"	467	16.12.2005
10	"Guidance on integrated environmental assessment at regional level"	584	14.11.2008

Environmental decentralisation reform

The reform started in 2010–2012 and resulted in the abolishment of the regional department of the Ministry of Ecology and Natural Resources. The significant changes occurred consequently to the Law No. 5456- VI (2012) on "Introducing Changes to Certain Legislative Acts of Ukraine with the Aim of Optimization of Powers

¹⁸ <http://uwea.com.ua/en/library/legals/zakon-ukrainy-ob-ocenke-vozdjeystviya-na-okruzhayuschuyu-sredu-2059-viii-ot/>

¹⁹ <https://menr.gov.ua/content/ekologichniy-monitoring-dovkillya.html>

and Authorities of the Executive Authorities in the Sphere of Ecology and Nature Resources, Including the Local Level.” This Law amended several earlier Laws and codes, including the Administrative Code, Water Code, Law on Environmental Protection, Law on Nature Reserve Fund, Law on Ecological expertise, among others. In addition, by this Law, several functions (permits for certain activities, monitoring, supervision, expert reviews, and so forth) were transferred from the central government (MENR) to local government (oblast state administrations - OSA).

In April 2014 the Cabinet of Ministers of Ukraine approved the Concept²⁰ for reforming local self-governance and territorial allocation of power in Ukraine. This triggered the reform of the so called “decentralisation of power” with as main goal to increase the effectiveness of local authorities. The decentralisation reform has three pillars:

- Delegation of powers to the lowest possible level
- Delegation of financial resources in line with the powers delegated
- State control over the activities of the local self-governing bodies

Since 2014 serious changes were introduced into the Tax Code, Budgetary Code, and a Regional Development Strategy was approved. The decentralisation reform is taking 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). Clearly, as a result, many environmental issues are going to be the responsibility of the local authorities in the future.

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

Main Directions of the National Policy of Ukraine for Environmental Protection, Natural Resources Use and Environmental Safety²¹

“Main Directions of the National Policy of Ukraine for Environmental Protection, Natural Resource Use and Environmental Safety” (i.e. “Main Directions”) was adopted by the Parliament’s Decree on March 5, 1998, for the implementation of the Article 16 of the Constitution of Ukraine and the Law “On Environmental Protection” (1991). The Main Directions document established a foundation for the development of several state targeted programs on environment that were adopted during 1999–2012.

National Environment Strategy 2020²²

The purpose of the national ecological policy is to stabilise and improve the condition of environment of Ukraine through the integration of ecological policy into the social and economic development of Ukraine, to guarantee the environmentally safe environment for life and health of human being, to introduce the ecologically balanced system of nature use and to preserve the nature.

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. Due to the National Environment Strategy importance, we summarise here its main principles in terms of national ecological policy:

- Responsibility of executive authorities for accessibility, timeliness and reliability of ecological information
- Accessibility, reliability and timeliness of receipt of ecological information

²⁰ <http://zakon3.rada.gov.ua/Laws/show/333-2014-%D1%80>

²¹ <http://zakon.rada.gov.ua/Laws/show/en/188/98-%D0%B2%D1%80>

²² <http://eng.menr.gov.ua/index.php/about/strategy>

- Strengthening the role of ecological governance within the system of state governance of Ukraine to achieve equality of three components of development: economic, ecological, social
- To take into consideration the ecological consequences when making decisions/developing documents which contain political, and/or programme principles of State, sectoral, regional and local development
- To foster inter-sectoral partnership and involvement of stakeholders
- Prevention of natural accidents through analysis and forecasting of ecological risks based on the results of strategic ecological assessment, State ecological expertise as well as state monitoring of environment
- Ensuring ecological safety and maintaining the ecological balance in the territory of Ukraine – e.g. removing the consequences of Chornobyl accident
- Preservation of environment for next generations
- Participation of public and business entities in formulation and implementation of ecological policy as well as considering their proposals when improving environment protection legislation
- Enforcement of Law for violation of environment protection legislation - “polluter of the environment and user of natural resources pay the full price”
- State support and stimulation of domestic business entities, which modernise production aimed to decrease the negative impact on environment

All these principles necessitate adequate governance and mechanisms for environmental data collection, monitoring, and sharing and dissemination. The Draft of the Law of Ukraine “On the Basic Principles of the State Environmental Policy of Ukraine for the period up to 2030”²³ - which might be approved soon - provides similar principles as the previous national ecological policy. Nonetheless, it consists in a larger list of strategic goals and objectives, and more stages of implementation as briefly described here after:

- By 2020 it is planned to reform the system of State ecological management, which will include 1) the differentiation of functions of environmental protection and entrepreneurship in using the natural resources, 2) the implementation of European environmental rules and standards, 3) improvement of environmental accounting and control systems, 4) the introduction of financial-economic mechanisms for the stimulation of (environmental) structural transformations of the economy, 5) implementation of mechanisms for stimulating enterprises for energy efficiency, 6) introduction of e-governance, dissemination of environmental knowledge
- By 2025, consolidation of changes in the system of public administration that took place during the first stage, increase of ecological consciousness of society, digitalisation of environmental protection and environmental management at each level
- By 2030, it is planned to 1) balance the socio-economic needs and tasks in saving the natural environment, 2) ensure the development of environment partnership between the private and public sectors, 3) foster low carbon development

Hence, the draft Law provides many elements to shape the State Environmental Policy, but it is to be noted that many points remains vague in terms of practical implementation.

Law of Ukraine “On Strategic Environmental Assessment”²⁴

The Law of Ukraine "On Strategic Environmental Assessment" defines the scope of strategic environmental assessment, establishes the procedure for its implementation and cross-border consultations. Nonetheless, there are no algorithms and effective mechanisms of strategic environmental assessment, and in practice the Law is not applied. In general, the Law has a similar approach than the EU Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (SEA Directive).

²³ http://w1.c1.rada.gov.ua/pls/zweb2/webproc4_1?pf3511=63948

²⁴ <https://zakon.rada.gov.ua/Laws/show/2354-19?lang=en>

Concept of Implementation the state policy in the field of climate change for the period up to 2030²⁵

The aim of the Concept is to improve the State policy on climate change to ensure a gradual transition to low carbon development. To implement the Concept, an Action Plan has been adopted on “the implementation of the Concept²⁶ and Strategy of Ukraine's Low Carbon Development by 2050”. Despite this, the Concept isn't implemented and there are still no relevant specialists and enough national knowledge in this area.

2.1.2 Main international policies and agreements

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

2.1.2.1 Multilateral Environmental Agreements with 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)

Ukraine ratified the Aarhus Convention in 18 November 1999. The Convention set out obligations to provide effective public access to environmental information within its broad scope hold by various public authorities, public participation in decision-making and access to justice in environmental matters. The progress of its implementation by Ukraine is reflected in national implementation reports for the Convention.²⁷

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)

Ukraine ratified the Protocol on PRTRs on 2 May 2016, becoming the thirty-fourth Party to join this Protocol to the Aarhus Convention. The Protocol establishes obligations for the Parties to establish PRTR, namely a national environmental database or inventory of potentially hazardous chemical substances released to air, water and soil and transferred off-site for treatment or disposal. As such, it allows the public authorities to track each release and transfer of a hazardous chemical substance consistently over time. The progress of its implementation by Ukraine is reflected in national implementation reports for the Protocol.²⁸

2.1.2.2 Other international forums promoting sharing and accessibility of environmental information

UNECE Environmental Performance Review for Ukraine

The United Nations Economic Commission for Europe (UNECE) together with its partners has been working with target countries to produce and share environmental data for 8 indicators:

- Emissions of pollutants into the atmospheric air
- Ambient air quality
- Consumption of ozone-depleting substances (ODS)
- Greenhouse gas (GHG) emissions
- Biochemical oxygen demand (BOD) and concentration of ammonium in rivers
- Nutrients in freshwater
- Protected areas
- Waste generation

According to the last assessment done by the UNECE, Ukraine publishes only 3 indicators online. As such, Ukraine seems to be behind other EaP countries.

²⁵ <https://zakon.rada.gov.ua/Laws/show/en/932-2016-%D1%80?lang=en>

²⁶ <https://zakon.rada.gov.ua/Laws/show/878-2017-%D1%80?lang=en>

²⁷ <https://aarhusclearinghouse.unece.org/national-reports>

²⁸ <https://aarhusclearinghouse.unece.org/national-reports>

Eighth Environment for Europe Ministerial Conference Batumi, Georgia

The Eighth Environment for Europe Ministerial Conference (Batumi, Georgia, 8-10 June 2016) adopted the Ministerial Declaration inviting countries to continue their efforts and to further develop their national information systems to have shared environmental information system in place in the countries of Europe and Central Asia by 2021.

Open Government Partnership Initiative²⁹

Ukraine is implementing the Open Government Partnership initiative since 2012. Open Government Partnership is a multilateral initiative that is a platform for national reformers, all aimed at making their governments more responsive to the needs of citizens. Since the start of the initiative the following objectives were achieved:

- Provision of access to public information in the form of open data, including environmental data;
- Improvement of public consultation procedures;
- Opening of access to the archives of the repressive authorities under the Communist regime;
- Creation of the required conditions to introduce a system for the filing and publication of declarations of entities authorised to perform the functions of national or local government;
- Launch of the unified state portal of administrative services, including approx. 40 e-services related to environment, such as the issuance of the permissions, declarations, certificates and others;
- Implementation of the electronic appeal submission process and the electronic petitions tool;
- Launch of the unified web portal on the use of public funds.

In addition, one of the current commitments is to introduce the public monitoring of the state of the environment. Expected results include creation of an open list of largest polluters in the regions as part of the development of a national automated environmental data system and creation of an electronic system for monitoring radiation safety and environmental threats. While a list of polluters has been compiled, the data portal and monitoring system are under construction. Overall, completion is limited.

International Open Data Charter³⁰

Ukraine joined the Open Data Charter in 2016. It has helped to drive the open data agenda within the Ukrainian government. With high-level backing, the State Agency for E-government, with the support of a USAID/UK project developed a roadmap for the implementation of Ukraine's commitment to open up government data.

The Open Data charter states 6 principles for how data should be published: open by default, timely and comprehensive, accessible and usable, comparable and interoperable, for improved governance and citizen engagement.

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 for the oil and gas sector companies, as well as coal and iron ore sectors. In the context of the EITI, Ukraine was the first world country to open a beneficial ownership register³¹ of legal entities, and asset register for government officials.

²⁹ <https://www.opengovpartnership.org/countries/ukraine>

³⁰ <https://opendatacharter.net/>

³¹ <https://usr.minjust.gov.ua/ua/freesearch>

The Extractive Industries Transparency Initiative acknowledged Ukraine's progress and achievements in opening data about company beneficiaries, and the ministry of justice was recognized with an award at the first national Open Data Awards competition.

EaPConnect Project³²

The Project aims to link the National Research and Education Networks in the partner countries to the pan-European research and education network GÉANT, and connects over two million scientists, academics and students from 700 institutions across the region. The joint initiative of EU, Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine is an example of effort undertaken to foster the creation of digital economies and promote Open Data in the EU Neighbouring countries.³³

The programme was launched in July 2015.

2.1.2.3 Cooperation with the EU

Declaration on Cooperation on Environment and Climate Change in Eastern Partnership³⁴

In 2016, The European Union (EU) and Eastern Partnership (EaP) countries adopted the Declaration on Cooperation on Environment and Climate Change, (so called Luxembourg Declaration). The declaration aims to strengthen regional cooperation on environment, climate action and sustainable development in the Eastern Partnership framework, through implementing relevant international agreements such 2030 Agenda for Sustainable Development and Paris Agreement on Climate Change, raising awareness among and cooperate with relevant stakeholders, supporting the involvement of civil society in decision-making, strategic planning and implementation, and results' monitoring of environmental policy, programmes and plans, and other commitments.

Ukraine has developed a roadmap³⁵ for the implementation of the Luxembourg Declaration. The roadmap aims to bring good environmental governance in Ukraine, with a view of opening the process of (environmental) policy-making.

Ukraine-European Union Association Agreement³⁶

The signing of Association Agreements between the European Union and three Eastern Partnership countries (Georgia, Moldova and Ukraine) in June 2014 serves as catalyst for further advancing EU standards and principles. Further efforts in the European Union cooperation will aim to contribute to the implementation of Association Agreements in certain areas of the environmental domain.

With this agreement, Ukraine committed to enhancing cooperation in the field of environmental protection and to the principles of sustainable development and green economy. Cooperation aims at preserving, protecting, improving, and rehabilitating the quality of the environment, protecting human health, prudent and rational utilisation of natural resources and promoting measures at international level to deal with regional or global environmental problems.

The Association Agreement, in its annex, lists several EU environmental directives relevant to access to environmental information & environmental monitoring which must be implemented by Ukraine.

³² <https://www.eapconnect.eu/>

³³ EDP Analytical Report 7, Open Data in the European Union Neighbourhood, page 9

³⁴ http://ec.europa.eu/environment/international_issues/pdf/declaration_on_cooperation_eastern_partnership.pdf

³⁵ <https://menr.gov.ua/news/31791.html>

³⁶ [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))

2.1.3 National standards and interoperability and quality control

2.1.3.1 Metadata standards

The EU-Ukraine agreement articles 355 and 356 state the requirements for Ukraine to align its statistical metadata dissemination with European Standards.

The following table presents the list of metadata standards available in Ukraine:

Table 1 - Metadata standards per portal

Component	Metadata standards
Open Data	The portal is based on CKAN platform, which is also used in many European Countries. There are no specific requirements regarding DCAT or other metadata standards, but one can deduce that their implementation should be considered. Currently there are no established metadata standards, and where metadata is used it is not clear to what extent data holdings are described by complete, accurate and detailed metadata records in practice.
Spatial	The geospatial data structure meets the requirements of INSPIRE Directive (2007/2/EU of the European Parliament and of the Council of 14 March 2007), international standards of ISO 19100 and national standards adapted on their basis.
Environmental data	The official statistical website doesn't provide any information over the metadata nor the quality control methods used. Nonetheless, the Articles 8,12 and 14 of the "Law on statistics" specify the obligation for the Statistical Office to elaborate and publish its methodology.

2.1.3.2 Quality control

The standards for data quality, including provenance, accuracy, timeliness and completeness of update on official webpages of authorities are regulated by the Decision of the Cabinet of Ministers of Ukraine No 3 from 2002 "On the Procedure for the publication on the Internet of information on the activities of executive bodies"³⁷. However, these standards were created almost a decade ago and need to be updated to meet modern data management standards.

Monitoring standards are based mainly on the use of maximum allowable concentrations. Only recently, Ukraine started introducing changes for implementation and adoption of the EU Integrated Pollution Prevention and Control Directive and use of the principle of best available techniques.

Last, the MENR website³⁸ publishes the "Methodological recommendations on the preparation, implementation and design report of ecological audit", which defines the quality controls and methodology for the draft of the report (only available in Ukrainian).

³⁷ <http://zakon.rada.gov.ua/Laws/show/en/3-2002-n>

³⁸ <https://menr.gov.ua>

2.2 National coordination

2.2.1 Environmental information stakeholders

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

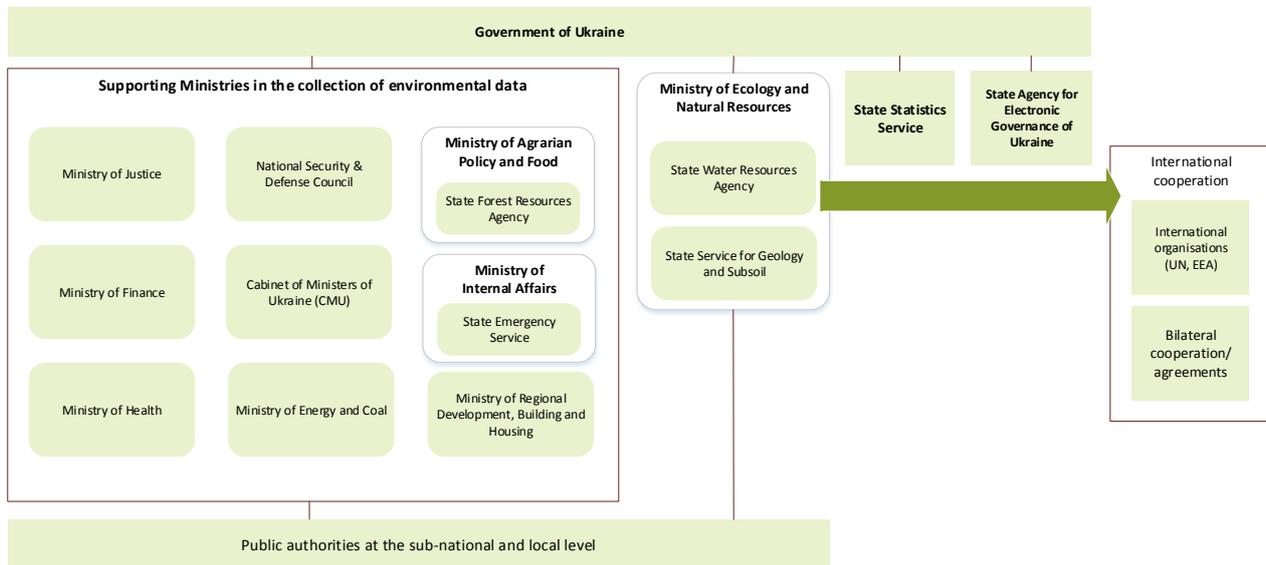


Figure 1 - Environmental, e-government & open data stakeholders

The Ministry of Ecology and Natural Resources (MENR) - <https://menr.gov.ua>

The MENR is the main state authority tasked with the key role to develop and ensure the implementation of environmental policy. It operates in the field of environmental protection, ecological safety, treatment of waste, hazardous chemicals, pesticides and agricultural chemicals and perform state ecological expertise. The Ministry of Environment and Natural Resources of Ukraine provides organisational and technical support for the Interagency Commission on Environmental Monitoring and its sections.

The Ministry is responsible for the monitoring and reporting on air quality and the following topics: preservation of ozone layer, restoration and protection of flora and fauna, restoration and protection of lands, restoration and protection of water resources (surface, ground, and sea water), efficient usage of water resources. Moreover, Ministry ensures legal and regulatory governing of the water management and land reclamation, geological study and efficient usage of mineral resources, as well as performs state supervision on the fulfilment of the requirements of the environment legislation.

Oblast state administrations (OSA) - regions

During decentralization reform, several functions (permits for certain activities, monitoring, supervision, expert reviews, and so forth) were transferred from the central government (MENR) to local (regional) government (oblast state administrations - OSA). The structure of departments varies and depends on the decision of OSA. All these regions have divisions for waste management, water resources, monitoring, protection of air, and so forth. Some regions created separate divisions of the state ecological expertise, while others combined this function with other functions. Such diversity creates problems for interaction with the central government, which is supposed to regulate the activities of the regional departments. As a result of this reform, there was a lack of information and assessment on how the reform was implemented, what were the results, and what is the environmental management set up on the ground.

Roles and responsibilities of OSA Environment Departments:

- Environmental monitoring and enforcement
- Environmental permits and licencing
- Environmental impact assessment
- Environmental disclosure

According to the analysis made by the Worldbank for Ukraine in 2016, there is virtually no coordination between regional environmental departments and other agencies. Although oblast departments are by Law “regulated” by MENR, coordination mechanisms between the MENR and the newly established OSA environmental departments need to be put in place and strengthened.

Non-governmental organisations

According to Ukraine’s NGO portal and the Worldbank 2016 report on the environment, approximately 1,500 non-governmental organisations all over the country, note “protection of environment” in their registration information (Single NGO Register 2015). Nonetheless, in practice, the number is expected to be lower since many of these are associations for hunting & fishing.

The State Service of Ukraine for Geodesy, Cartography & Cadastre - <http://land.gov.ua/en/>

The State Service of Ukraine for Geodesy, Cartography and Cadastre (StateGeoCadastre) is a central executive body that is coordinated by the Cabinet of Ministers of Ukraine via the Vice-prime-minister of Ukraine – Minister of Regional Development, Construction and Housing of Ukraine. The StateGeoCadastre is responsible for the implementation of the state policy in the matter of topography, geodesy, cartography, land relations and state land cadastre. Key functions of the StateGeoCadastre are the following:

- conducting the legislative activities within the scope of competence
- development of international cooperation in the mentioned directions
- coordination and ensuring the state control under the sphere of topography, geodesy and cartography
- development of state geodetic network
- development of National Spatial Data Infrastructure and standards in the matter of geodesy and cartography
- coordination of the activities in the matter of geographical names, creation of the National Register of Geographic Names
- administration of the State land cadastre
- providing the state registration of land parcels
- management of the state-owned agricultural land
- maintaining the State register for land surveyors

Other national institutions

In addition to the MENR and its agencies, several ministries and state services affect environmental management within their specific area of competences. These organisations are described in the point “Environmental data flow” of this document.

The State Agency for Electronic Governance in Ukraine

The State Agency for E-Governance of Ukraine was created on 1st of October 2014 and implements state policy in the spheres of e-government and information society development. The agency identifies these areas of e-government for development by 2020: modernisation of public services for citizens and business, modernization of public services by the government, management of e-governance development. The Agency also is responsible for the development of the national open data portal, which also publishes environmental data.

2.3 Environmental data flow

In general, the main system for environmental monitoring is the SEMS (State Environment Monitoring System). In terms of information, the MENR receives all environmental information, which are transmitted to the Information Analytical Centre (IAC) of the MENR. Based on the received data, the ministry issues the information-analytical overview “Environmental Conditions in Ukraine” and publishes it on MENR’s Web site. The table below shows the inter-institutional cooperation for data exchange.

The figure below presents the main actors in Information Analytical Centre of State Environmental Monitoring System (SEMS) and illustrates the data flow between organisations and systems.

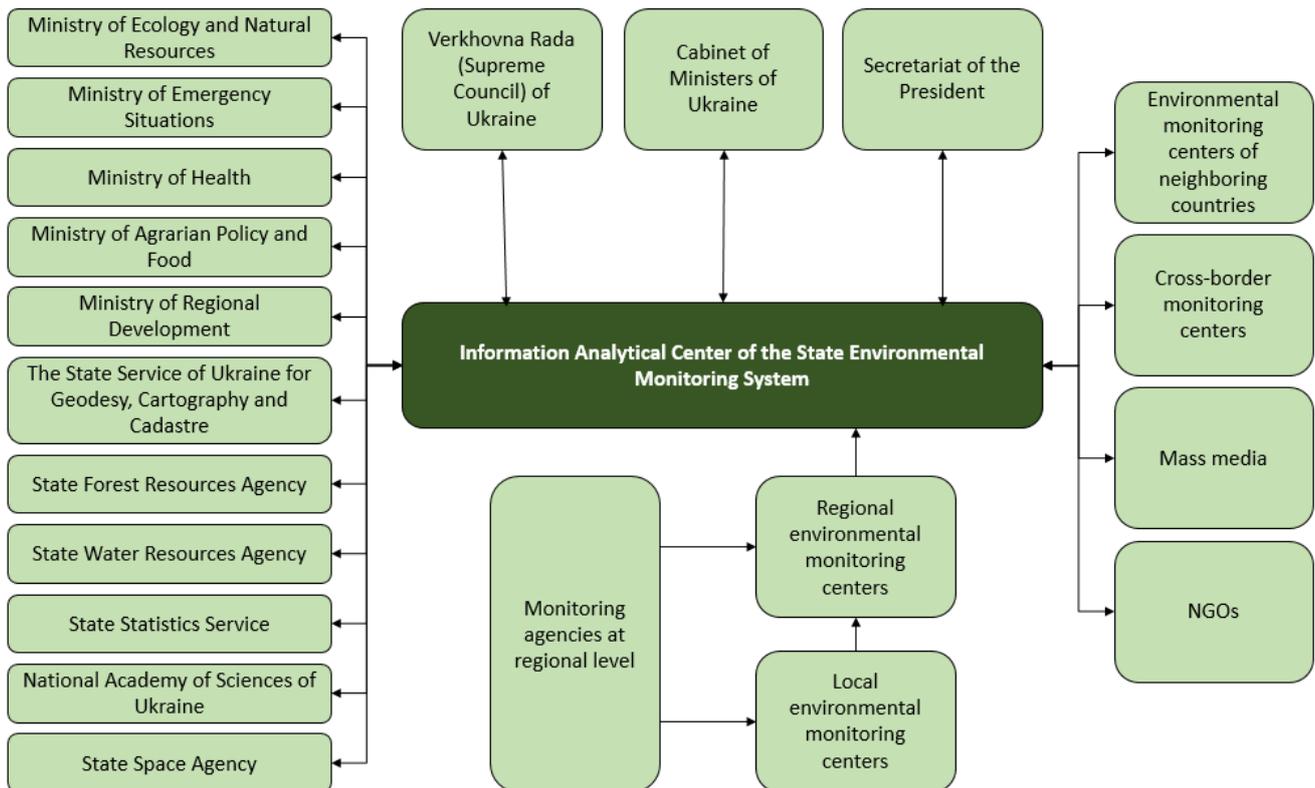


Figure 2. Data flows in State environmental monitoring system

In total 10 state entities perform the monitoring and information support using the SEMS, including the Ministry of Environment, the Ministry of Emergencies, the Ministry of Health, the Ministry of Agriculture, Food and Forestry Policy, the State Housing and Municipal Services Committee, the State Water Management Committee, the State Forestry Committee, the State Land Committee. These ministries and national agencies are referred by the MENR as “subjects” and monitor the environmental objects that are specified by the Regulation on the State Environment Monitoring System (SEMS) and the procedures and Regulations of the state monitoring of individual components of the environment.

The State Environment Monitoring System is the central system in Ukraine for monitoring the state of the environment and the level of its pollution. Each of the SEMS subjects monitors of the environmental objects that are specified by the Regulation on the State Environment Monitoring System and the procedures and Regulations of the state monitoring of individual components of the environment.

SEMS is defined by the Statement on the state monitoring system. It is a distributed system having its functions spread amongst national entities contributing to environmental monitoring. Each subsystem has its

own structural and organisational, methodological and technical framework. The SEMS operates at three levels, which are determined based on the coverage:

- National level, covering the monitoring priorities and objectives throughout the country
- Regional level, covering the monitoring priorities and objectives across a region
- Local level, covering the monitoring priorities and objectives within certain areas with high anthropogenic load

By its Resolution of 05.12.2007 № 1376, the Cabinet of Ministers of Ukraine approved the State Special-Purpose Program of Environmental Monitoring. The program aims to combine the efforts of all the subjects of the monitoring system to exclude duplication and enabling advanced features of monitoring, the creation of the unified monitoring network based on optimisation of its elements and observation programs and improvement of technical, methodological, metrological and scientific operation of the single monitoring network. To ensure the integration of information resources, the subjects of the environment monitoring system provides for the establishment and operation of a single subsystem of automated collection, processing, analysis and storage of data and information derived from monitoring³⁹.

The Provision about State Environmental Monitoring System, adopted by the CMU in 1998 and updated in 2013 refers to the collaboration between different stakeholders regarding monitoring information. However, there is no clear responsibilities and enforcement between the state bodies at national and regional levels, particularly in the context of last administrative reforms and review of functions between different organisations in environmental sphere. To coordinate the exchange of information, bilateral agreements between national environment entities and the MENR have been signed.

In Ukraine, the work of the monitoring bodies is regulated by the statutory and methodological documents. The only principle that is adopted in these documents is the environmental (different components of environment) approach in the monitoring i.e. monitoring of air, surface waters, ground water, geological environment, etc.

³⁹ <http://eng.menr.gov.ua/index.php/monitoring>

2.3.1 Environmental administrative information, statistics and assessment reports

2.3.1.1 Statistics and reports

National statistics

The State Statistics Service provide this meta-description of environment statistics.

Table 2 - National environment statistics

Area and its objective	Basic statistical indicators	Statistical products
<p>Protection of atmosphere air – Obtain data on emissions of pollutants and greenhouse gases into the atmosphere air by stationary sources of pollution</p>	<ul style="list-style-type: none"> Emissions of pollutants and greenhouse gases by type of pollutant, region, type of economic activity (by the KVED class) Emissions of pollutants per persons, area unit, GDP unit (PPPs at the 2011 constant prices) Number of the air protection measures implemented in the reference year by region, Expenditure for the measures aimed at reducing emissions into the air, Expected and actual volumes of the reduced emissions of pollutants into the air after implementing the air protection measures by region 	<p>Statistical abstracts:</p> <ul style="list-style-type: none"> Ukraine in Figures Ukraine Regions of Ukraine Environment of Ukraine Social indicators of population living standards <p>Statistical information on the site:</p> <ul style="list-style-type: none"> Economic activity/ Environment/ Emissions of pollutants into atmosphere air by stationary sources of pollution, Emissions of pollutant substances and carbon dioxide into the air, Emissions of pollutant substances in the Ukraine's air Multi-sectoral statistical information/ Regional statistics/ Environment/Emissions of pollutant substances into the air by region, Emissions of carbon dioxide into the air by region, Emissions of pollutant substances into the air by stationary sources of pollution <p>Quality reports:</p> <p>Standard report on quality of the state statistical observation "Air protection", 2017</p>
<p>Generation and treatment of wastes – Obtain data on generation and treatment of wastes</p>	<ul style="list-style-type: none"> Generation of wastes, generation of wastes per person and area unit Incinerated wastes, removed wastes, utilized wastes Available wastes collected (obtained) wastes, general amount of wastes accumulated during exploitation at the sites for wastes removal 	<p>Statistical abstracts:</p> <ul style="list-style-type: none"> Statistical yearbook of Ukraine Regions of Ukraine Environment of Ukraine Social indicators of population living standards <p>Statistical information on the site:</p> <ul style="list-style-type: none"> Statistical information/ Economic activity/ Environment/ Basic indicators of treatment of wastes (1994-2017) Generation and use of wastes by category of materials; Treatment of household and similar wastes in Ukraine in 2011-2017 Wastes generation by type of economic activity, Generation and treatment of wastes by classification grouping of the state wastes classification

Area and its objective	Basic statistical indicators	Statistical products
		<ul style="list-style-type: none"> Statistical information/ multisector statistical information/ Regional statistics/ Environment/ Number of installations for wastes treatment at specially allotted sites and facilities for wastes removal, Generation and treatments of wastes, Total amount of wastes accumulated during exploitation at sites for wastes removal <p>Quality reports: Standard report on quality of the state statistical observation "Generation and treatment of wastes", 2017</p>
<p>Expenditure for protection of environment and ecological payments – Obtain data on expenditure for protection of environment and provision of ecological services</p>	<ul style="list-style-type: none"> Expenditure for environmental protection Capital investment into protection of environment Expenditure for capital repair of fixed assets intended for nature protection purposes Current expenditure for protection of environment; Funds received for provision of ecological services for selling wastes and by-products obtained while implementing nature protection measures Funds paid for the provision of ecological services 	<p>Statistical abstracts:</p> <ul style="list-style-type: none"> Statistical yearbook of Ukraine Regions of Ukraine Environment of Ukraine <p>Statistical information on the site:</p> <ul style="list-style-type: none"> Economic statistics/ Environment/ Expenditure for protection and sustainable use of natural resources by purpose of expenditure for nature protection Economic statistics/ Environment/ Capital investment for environmental protection by purpose of nature protection measures Economic statistics/ Environment/ Current expenditure for environmental protection by purpose of nature protection measures Multi-sectoral statistical information/ Regional statistics/ Economic statistics/ Environment/Expenditure for environmental protection by region Multi-sectoral statistical information/ Regional statistics/ Economic statistics/ Environment/ Capital investment into environmental protection by region Multi-sectoral statistical information/ Regional statistics/ Economic statistics/ Environment/ Current expenditure for environmental protection by region <p>Quality reports:</p> <ul style="list-style-type: none"> Standard report on quality of the state statistical observation "Expenditure for environmental protection and ecological payments", 2017
<p>Ecological account of</p>	<ul style="list-style-type: none"> Emissions into the air by 	<p>Statistical information on the site:</p>

Area and its objective	Basic statistical indicators	Statistical products
air protection – Obtain information on relationships between the emissions into the air and economic indicators of the country	households: carbon dioxide, nitrogen oxide, methane, nitrogen dioxide, sulphur dioxide, ammonia, non-methane volatile organic compounds, suspending particulate matters more than 2.5 mkm and less than 10 mkm, suspending particulate matters of 2.5 mkm and less, hydro-fluoro-carbon by emission sources (heating, transport, etc.)	Economic activity/Environment/Ecological account on air protection/ Ecological account on air protection for 2016

Environmental assessment reports

The ENI SEIS II East page⁴⁰ summarises the environmental assessment reports published in Ukraine. Reports are published by the MENR, the State Statistic Service and international organisations such as the United Nations.

Type of Report	Report?	Institution publishing the report
National environmental reports	Yes	MENR: https://menr.gov.ua/news/31768.html Frequency: annual
Specialized reports - climate (national communications to UNFCCC)	Yes	United Nations Climate Change: http://unfccc.int/national_reports/national_communications_and_biennial_reports/submissions/items/7742.php
Specialized reports – air	Yes	State Statistics Service: http://www.ukrstat.gov.ua/druk/publicat/kat_u/publnav_ser_u.htm Frequency: annual
Specialized reports – water	Yes	The MENR has a page for water reports, but now no report is published. The Statistical Office publishes one report, but dating from 2015 http://www.ukrstat.gov.ua/druk/publicat/kat_u/publnav_ser_u.htm Frequency: unknown
Specialized reports - biodiversity	Yes	Convention on biological diversity: https://www.cbd.int/doc/world/ua/ua-nr-05-en.pdf Frequency: every 4 years
Specialized reports – waste	Yes	Annual brief information by the Ministry of Regional Development and Construction about municipal wastes management. http://www.minregion.gov.ua/napryamki-diyalnosti/zkhk/terretory/stan-sferi-

⁴⁰ <https://eni-seis.eionet.europa.eu/east/countries/ukraine>

Type of Report	Report?	Institution publishing the report
		povodzhennya-z-pobutovimi-vidhodami-v-ukrayini-za-2017-rik/ Frequency: annual
Indicator-based reports	No	
National Statistical Yearbook	Yes	State Statistics Service: http://ukrstat.gov.ua/druk/publicat/kat_u/publ1_u.htm Frequency: annual
National Statistical Yearbook on environment	Yes	State Statistics Service: http://www.ukrstat.gov.ua/druk/publicat/kat_u/publnav_ser_u.htm Frequency: yearly
Report on sustainable development	Yes	United Nations: http://www.un.org.ua/images/SDGs_NationalReportEN_Web.pdf

2.3.1.2 Indicators

National indicators

The following tables provides information about the monitored indicators according to main UNECE environment components, as described by the MENR and publicly available information^{41,42}.

Air

National entity	Monitoring indicators
State Emergency Service of Ukraine⁴³	Air pollution in 53 Ukrainian cities and towns using 162 stationary sites, two route observation sites and two cross-border transfer stations.
State Agency for Exclusive Zone Management	Air pollution, soil, water, biodiversity, in the Exclusive Zone (Chornobyl Zone).

Water

National entity	Monitoring indicators
State Emergency Service of Ukraine	<ol style="list-style-type: none"> 1. Hydrochemical state of water at 151 water bodies and carries out hydrobiological observations at 45 water bodies. The data are collected on 46 parameters, which allow assessment of the chemical composition of water, biogeous parameters, presence of suspended particles and organic substances, the main pollutants, heavy metals and pesticides. 8 water bodies are observed for chronic toxicity of water. The indicators of radioactive contamination of surface waters are also determined. 2. Operates a coastal water monitoring network, which includes monitoring stations in the places of waste water disposal and research stations located in the coastal areas of the Black and Azov Seas. The existing stations measure 16 to 26 hydro chemical parameters of water and bottom sediments.
State Geological Survey (the	Monitors the state of groundwater. In the places of monitoring, the level of

⁴¹ <https://zakon.rada.gov.ua/laws/show/en/391-98-%D0%BF>

⁴² <http://eng.menr.gov.ua/index.php/monitoring>

⁴³ Actually done by Ukrainian Hydrometeorological Center, <https://meteo.gov.ua/en/>

Ministry of Environment)	groundwater (occurrence), its natural geochemical composition is assessed. 22 parameters, including heavy metals and pesticides concentration are determined.
Ministry of Environment of Ukraine	Monthly sampling and analysis of the impact of pollution sources located on the coast; monitoring of discharges from ships; pollution resulted from activities of exploration and extraction of oil, gas and building materials offshore; supervising the use of marine living resources; monitoring sea waters and bottom sediments.
State Agency for Water Resources	Has key responsibility over monitoring surface water resources in Ukraine. Recently a number of data sets were made public: https://data.gov.ua/organization/derzhavne-ahentstvo-vodnykh-resursiv-ukrayiny

Biodiversity

National entity	Environmental data
Ministry of Environment	Endangered species; flora and fauna in the protected areas managed by MENR; marine biodiversity.

Land and soil, and Agriculture

National entity	Monitoring indicators
State Emergency Service of Ukraine	Monitors soil contamination of agricultural lands with pesticides and heavy metals in the settlements. The samples are taken every five years, the samples for heavy metals tests in the towns of Kostiantynivka and Mariupol are taken every year.
Ministry of Health	Soil conditions in the territories of their possible negative impact on the health of the population. These are mostly the areas covered by the cultivation of agricultural products, the areas where pesticides are used, soils in residential areas, children playgrounds and schools. Soil samples taken in the places of storage of toxic wastes on the territory of enterprises and outside such territories in the places of storage or disposal are investigated.
Ministry of Agricultural Policy	Monitor use of agricultural soils. Radiological, agro-chemical and toxicological indicators, the residual amount of pesticides, chemicals and heavy metals are determined.
State Geological Cadastre	Responsible for land Cadastre.

Energy

National entity	Environmental data
State Emergency Service of Ukraine	<ol style="list-style-type: none"> 1. Radioactive contamination of the atmosphere by daily measurements of doses of gamma radiation exposure (GRE), impaction of radioactive particles from the atmosphere and the content of radioactive aerosols in the air. 8 water bodies are monitored for radioactive contamination of surface waters. 2. Measures radioactive pollution of surface waters with cesium-137 and soil pollution around nuclear power plants. 3. Monitors GRE doses at 10 automated stations near nuclear power plants. Within the 30-km zone around the Chernobyl Nuclear Power Plant (exclusion zone), the Ministry monitors the concentration of radio nuclides, the radio nuclides in atmospheric precipitations and

	concentration of "hot" particles in the air. The International Radioecology Laboratory of Chernobyl Centre for Nuclear Safety, Radioactive Wastes and Radioecology located in Slavutych monitors the effects of radiation on biota in the exclusion zone.
Ministry of Health	Soil conditions in the territories and their possible negative impact on the health of the population. These are mostly the areas covered by the cultivation of agricultural products, the areas where pesticides are used, soils in residential areas, children playgrounds and schools. Soil samples taken in the places of storage of toxic wastes on the territory of enterprises and outside such territories in the places of storage or disposal are investigated.
Ministry of Agricultural Policy	Control of concentration of radioactive substances in soils and foods.

Waste

National entity	Environmental data
Ministry of Regional Development and Construction	Statistics on municipal wastes are gathered by the Ministry of Regional Development and Construction.

UNECE environmental indicators

The State Statistics Service develops a series of environmental data in UNECE format.

Ukraine also uses UNECE data standards on environmental statistics. There's constant cooperation within UNECE on this and Ukraine's statistical agency even publishes reports in UNECE formats. See here: http://www.ukrstat.gov.ua/operativ/menu/menu_u/ns.htm. The data sets produced in the UNECE format include:

- Emissions into the air
- Use of mineral and organic fertilizers
- Wastes generation by type of economic activity
- Passengers turnout in transport
- End use energy consumption
- General primary energy supply
- Energy productivity of GDP
- Energy consumption from renewable energy sources

Some environmental statistical information (such as on forestry) is also shared with UNECE and is accessible via UNECE databases online.⁴⁴

⁴⁴ <https://w3.unece.org/PXWeb/en>

2.3.2 Environmental data sharing arrangements

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

Table 3 Inter-institutional cooperation for environmental data exchange

Institution	Environmental data	Arrangement
The Ministry of Ecology and Natural Resources of Ukraine http://www.menr.gov.ua/	Atmospheric air Sources of emissions Surface (including marine water) Sources of discharge Ground waters Soils and landscapes Waste (except municipal)	Receives information from the Ministry of Health of Ukraine, the Ministry of Agrarian Policy and Food of Ukraine, State Forest Resources Agency of Ukraine, State Water Resources Agency of Ukraine, State Land Resources Agency of Ukraine, State Services for Geology and Subsoil of Ukraine, State Statistics Services of Ukraine, enterprises and organisations, local authorities.
The Ministry of Health of Ukraine http://www.moz.gov.ua/ua/portal/ centre of medical statistics of the Ministry of Health", created by order of the Ministry of Health in 1992 ⁴⁵ http://medstat.gov.ua/ukr/about.html	Atmospheric air Surface waters Drinking water Soils Impact of physical factors	Receives information from the establishments managed by the Ministry (including sanitary and epidemiological stations), enterprises and organisations, local authorities. The centre of medical statistics provides timely statistical information on the management of the Ministry of Health, the Ministry of Chief Specialists, the heads of health departments of territorial (municipal) state administrations and heads of territorial medical statistical offices.
The Ministry of Agrarian Policy and Food of Ukraine http://www.minagro.gov.ua/	Surface waters Soils Plants Animals	Receives information from the establishments managed by the Ministry, enterprises and organisations, local authorities.
State Forest Resources Agency of Ukraine http://dklg.kmu.gov.ua/forest/control/uk/index	Soils Forest vegetation Fauna	Receives information from the establishments managed by the Ministry (that are under the Ministry) enterprises and organisations, local authorities.
Ministry of Energy and Coal industry http://mpe.kmu.gov.ua/	Coal Natural gas	
State Water Resources Agency of Ukraine http://www.scwm.gov.ua/	Water objects and water bodies Surface waters Irrigated and drained lands Submergence area	Receives information from the establishments managed by the Ministry, enterprises and organisations, local authorities.
State Service of Geodesy, Cartography and Cadastre http://land.gov.ua/	Lands Soils Landscapes	Receives information from the establishments managed by the Ministry, enterprises and organisations, local authorities.

⁴⁵ The main tasks of the Centre are centralised collection, processing and analysis of statistical information on the state of health, provision of medical care to the population, on health care resources and their use. In addition, it develops and implements the health statistical methodology and ensures the quality and completeness of statistical information.

Implementation of the Shared Environmental Information System principles and practices in the Eastern Partnership countries (ENI SEIS II East)

<p>The Ministry of Regional Development, Building and Housing http://www.minregion.gov.ua/</p>	<p>Drinking water Sewage waters Green plantations Submergence areas Municipal wastes and landfills</p>	<p>Receives information from the establishments managed by the Ministry, enterprises and organisations, local authorities.</p>
<p>State Service for Geology and Subsoil of Ukraine http://www.dgs.kiev.ua/</p>	<p>Ground waters Endogenic and exogenic processes Geophysical fields Landscapes</p>	<p>Receives information from the establishments managed by the Ministry, enterprises and organisations, local authorities.</p>
<p>State Statistics Service of Ukraine http://www.ukrstat.gov.ua/</p>	<p>Atmospheric air Sources of emissions Surface waters Sources of discharge Land resources Forest resources Reserved territories and game areas Waste</p>	<p>Receives information from the Ministry of Ecology of Ukraine, the Ministry of Health of Ukraine, the Ministry of Agrarian Policy and Food of Ukraine, State Forest Resources Agency of Ukraine, State Service of Geodesy, Cartography and Cadastre, State Water Resources Agency of Ukraine, the Ministry of Housing and Utilities, State Service for Geology and Subsoil of Ukraine, enterprises and organisations, local authorities.</p>
<p>State Emergency Service http://www.dsns.gov.ua/en/</p>	<p>Atmospheric air Surface (including marine) waters Ground waters Soils and landscapes Radioactive waste</p>	<p>Receives information from establishments managed by the State Emergency Service, enterprises and organisations, local authorities.</p>

2.3.3 Licensing norms

The following tables describes the licences available on the main environmental portals:

Table 4 - Licensing norms per portal

Portal	Licensing
<p>https://data.gov.ua/</p>	<p>Open data refer to data that anyone can access, use/ re-use and share. All content on the national Open data portal is licensed under the Creative Commons Attribution 4.0 International License (CC BY 4.0), unless otherwise noted. 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 indicate if changes were made. However, the use of open licenses is relatively new to Ukraine and thus not well established. It is to be noted that the process for publishing Open Data itself costs money to governmental organisation.</p> <p>Before the Open Data Law there were no established policies for licensing government hold information or data, in practice Government agencies decided how to license or permit the release/use of their data. The Amendments in the Access to Public Information Law clearly mandates for information and data must be available freely for reuse (even if it does not mention an “open licence” as such).</p>
<p>Environmental departments</p>	<p>No data published by public authorities can be copyrighted. Nonetheless, there are some data which are sold by agencies (e.g. State meteorological service) as “services”.</p> <p>Environmental departments share information they have with the public upon request through the MENR website. As a basis, the Ministry of Environment sets the rules for what environmental information can be published/shared from regions – this implies that regions first need an authorisation to share information.</p>
<p>Statistical Office</p>	<p>Documents are republished in strict accordance with international and Ukrainian legislation, in particular: EU Directive on the public sector on November 17, 2003 Art. 10 p. C) of the Law of Ukraine "On copyright law and sum of rights".</p> <p>No licence is specified on the website.</p>

2.4 Progress so far

2.4.1 Main initiatives

In general, Ukraine has made a lot of progress in terms of e-services and open data. Here below more details about main initiatives shaping the e-government and open data landscape in Ukraine.

Initiatives by State Agency for E-Governance of Ukraine

Implementation of the e-governance system in Ukraine is focused on solving the following issues: non-transparent, closed nature, high corruption level at government authorities; development of decentralization mechanisms, democratic control and citizens' participation in development and implementation state policy; regaining citizens' trust to public institutes and civil servants at both state authorities and local self-governing bodies.

“Trembita”

As one of initiatives by State Agency for E-government, an electronic interaction system of the state electronic information resources “Trembita” is being implemented. The system is used for organisation of data exchange between government registers and helps to reduce time needed to provide services as well as efforts of the services' client's to gather all documents needed for 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.

Civic Engagement and Capabilities for Open Data

Government authorities have recently engaged with civil society or others in co-creation of apps development or promoting reuse of its data. A recent consultation on Open Data availability indicates a move towards engaging citizens more on data. There is a notable ICT sector, even if the Apps Economy is still young and small. Universities produce significant number of technical graduates, have track record of ICT collaboration with private sector and advanced research in leading areas like analytics, advanced statistics, and semantic web technologies.

Creation of National Spatial Data Infrastructure in Ukraine

The creation of the National Spatial Data Infrastructure in Ukraine enabled the enrichment of data geographic data. The National Spatial Data Infrastructure facilitates access to, and use of, some of the data required for SEIS implementation.

The adoption of the draft Law “On the national infrastructure of geospatial data of Ukraine” provided the establishment of legal foundations for the development of National Geospatial Data Infrastructure. The creation of a National Geospatial Data Infrastructure⁴⁶ included the EU INSPIRE directive, which is available to all EU Members and candidate countries.

Thanks to the development of NGDI, public authorities, local self-government and private sector representatives can rely on a complete and reliable information base for decision-making on land relations and development of territories, information needs in construction and engineering surveys, ecology, navigation, defence and security of the state.

Creation of the open data portal⁴⁷

In 2014, the national open data portal was launched by PO SocialBoost in cooperation with the Ukrainian government. In August 2018, the new version of open data portal was created. The Open Data Portal was

⁴⁶ http://nsdi.land.gov.ua/ua/metadata_list

⁴⁷ <https://data.gov.ua/en/>

developed by the Opendatabot team within the framework of the USAID / UK aid project 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.

On Approval of the Concept of Reform systems of state supervision (control) in the sphere environmental protection, May 1, 2017, No. 616-p, CABINET OF MINISTERS OF UKRAINE

The Government approved the Concept for reforming⁴⁸ the system of State supervision (control) in the field of environmental protection. The document provides for the implementation of the provisions of the program documents on the reform of the system of state supervision (control), the creation of a single integrated body of environmental oversight (control) and elimination of duplication of functions in this area. It is proposed to introduce a State system of environmental monitoring, to create a State Environmental Protection Service and to liquidate the State Environmental Inspectorate, to create new interregional environmental services within the newly created service. Selection for all positions will be carried out on a competitive basis. Also, the concept laid the foundation for the transition from the system of total planned supervision (control) to the monitoring system, prevention of violations of environmental legislation and control based on risk-oriented indicators.

Reforming the environmental state monitoring⁴⁹

Two important steps have been made recently to reform state environmental monitoring:

- A completely new framework for water monitoring in Ukraine introduced since 2019⁵⁰
- A draft new framework for air monitoring⁵¹.

Both reforms are based on and aim at implementing relevant EU acquis requirements (WFD and AQD).

Developing of the Concept of establishing the National Automated System "Open environment" ⁵²

In November 2017 the Government of Ukraine adopted the Concept for establishing a national on-line data information system "Open environment"⁵³. The concept outlines a framework for creating a comprehensive system of management of environmental information. The system – called "Open environment" is to be established in 2018-2020.

The system will comprise 5 major elements (components): (1) environmental management system, (2) analytical sub-system, (3) portal of administrative services and State environmental registers, (4) geo-portal of environmental data and (5) information sharing segment. The last element – information sharing segment – is serving the purpose of interoperability of the data with national and international databases and information sharing systems.

Several other recent initiatives increase access to various types of environmental information:

- EcoMap <https://ecomapa.gov.ua/>
- Web portal on protected areas: <http://pzf.menr.gov.ua/>
- Water Environmental Monitoring and Assessment portal: <http://watermon.iisd.com.ua/>
- Clean Water portal: <http://texty.org.ua/water/>

⁴⁸ <https://www.kmu.gov.ua/ua/npas/250269536>

⁴⁹ <https://www.kmu.gov.ua/ua/npas/250269536>

⁵⁰ <https://www.kmu.gov.ua/ua/npas/pro-zatverdzhennya-poryadku-zdijsnennya-derzhavnogo-monitoringu-vod>

⁵¹ <https://menr.gov.ua/news/33051.html>

⁵² Summary of the concept in Ukrainian : <https://menr.gov.ua/files/images/news/06032018/1.jpg>

⁵³ <https://menr.gov.ua/news/32130.html>

In 2013-2014 a pilot application in Ukraine⁵⁴ of the OECD Green Growth Monitoring Indicators⁵⁵ revealed several weaknesses of the current system of access to environmental data in Ukraine when compared to the data sets usually available in the OECD and/or EU countries. Whole series of environment related information is not available or accessible in Ukraine, in particular on energy and production productivity, air pollution, species information, soils use, etc.⁵⁶

2.4.2 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 Online Service Index, Telecommunication Infrastructure Index and Human Capital Index.

In 2018, Ukraine scored 0.6165 and was ranked in #82 out of 193 countries. The figure below shows the change of EGDI throughout period. Ukraine improved a lot in Online Service Index thanks to initiatives such as the Public Service Centre, a one-stop-shop in Kharkiv providing more than 400 administrative and social services. Ukraine aim to reduce corruption in the country, delivering corruption-free public services quickly and conveniently is key to convincing Ukraine’s citizens that positive change, affecting ordinary people, is taking place in their county. The portals <https://igov.org.ua/>⁵⁷ and <http://poslugy.gov.ua/>⁵⁸ also provides online access to public services. In addition, institutions can create their own portal for accessing online their services. Even if Ukraine progressed a lot in terms of e-services, the next steps will have to focus on the creation of a unique portal which will provide a central access to all (or most) e-services for citizens.

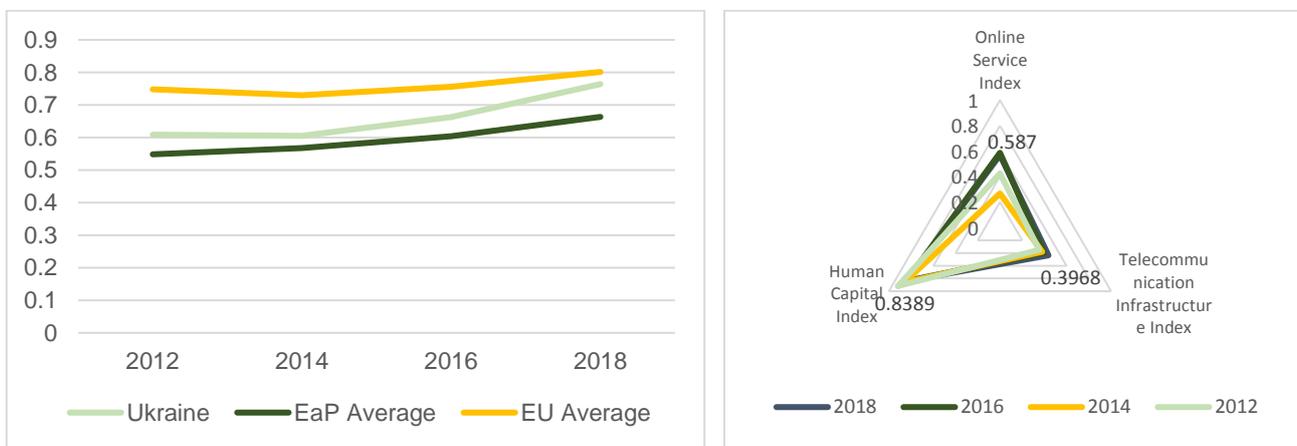


Figure 3 EGDI of Ukraine

The Telecommunication Infrastructure Index improved slightly in recent years (2016-2018). Today nearly 35% of the rural population, as well as 53% of schools and 99% of medical institutions in Ukraine lack access to the broadband Internet. As such, the Ukrainian government presented a roadmap⁵⁹ for developing digital

⁵⁴ <http://www.rac.org.ua/priority/zelene-zrostannya/na-shlyakhu-do-zelenogo-zrostannya-monitoryng-progresu-v-ukrayini-2014>

⁵⁵ <http://www.oecd.org/greengrowth/green-growth-indicators/>

⁵⁶ <http://www.rac.org.ua/uploads/content/101/files/nutshell-eng-final.pdf>

⁵⁷ Developed by volunteers listed on the website.

⁵⁸ Developed by the Ministry of Economy.

⁵⁹ <https://issuu.com/mineconomdev/docs/>

economy and society in Ukraine in the upcoming years (2018-2020). It is to be noted that Ukraine could itself from Georgia in regards with the development of telecommunication infrastructure.

Global Open Data Index⁶⁰

The Global Open Data Index (GODI) is the annual global benchmark for 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 Government budget, spending and procurement, access to information about land ownership, election results at all levels and national statistics.

In 2017, Ukraine ranked #31 out of 94 countries and scored 48% out of 100. However, only 20% of datasets are open, according the Open definition (*“Open means anyone can freely access, use, modify, and share for any purpose (subject, at most, to requirements that preserve provenance and openness).”*)

The Open Data Inventory (ODIN) score⁶¹

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 (NSOs) and data users.

Ukraine ranks 74th in the Open Data Inventory 2017 with an overall score of 42%. The overall score is a combination of a data coverage sub-score of 47% and a data openness sub-score of 37%. Ukraine scores lower than the regional average across all three major data categories. Within the country, the highest levels of coverage and openness are on economic information, but the lowest levels are on social information, as a result environmental information is rated in the middle. In particular, the environment coverage sub-score is 50% and openness sub-score is 42%.

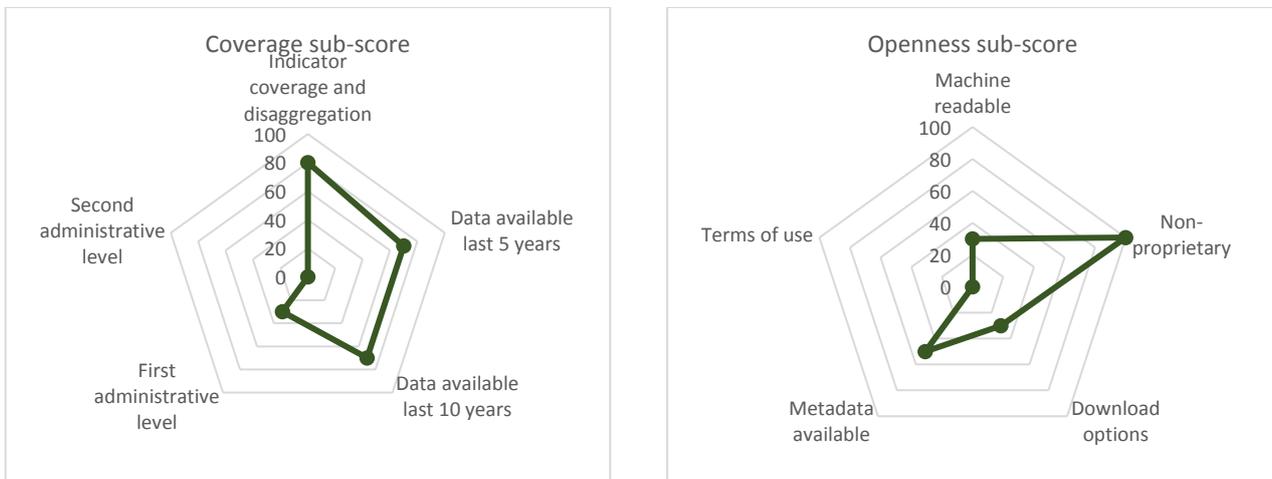


Figure 4. Coverage sub-score and Openness sub-score of Environment Statistics

Open Data Barometer

⁶⁰ <https://index.okfn.org/place/ua/>

⁶¹ <http://odin.opendatawatch.com/Report/countryProfile/UKR?appConfigId=4>

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.

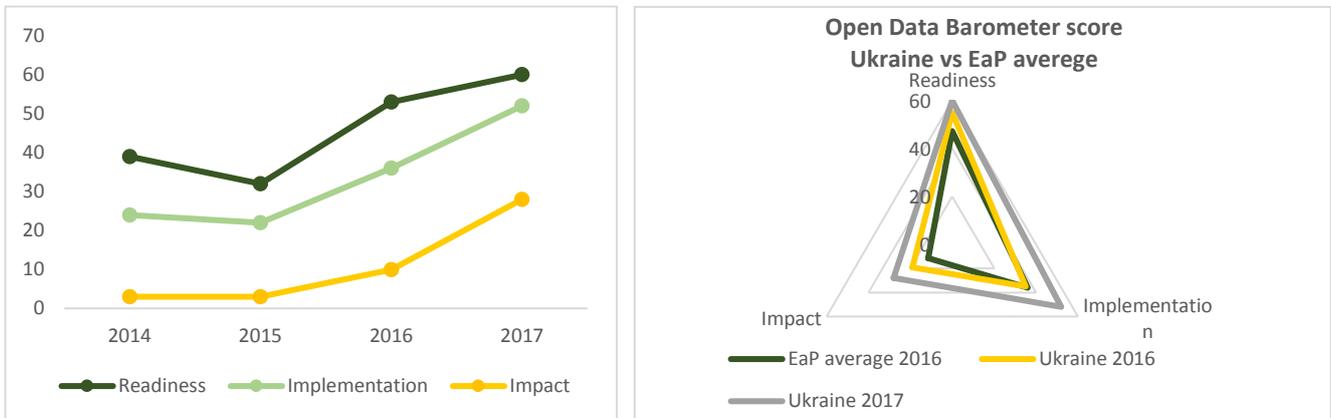


Figure 5 - Open data barometer score results 2014 – 2017

The second graph compares the EaP average of 2016 (the latest scores available for Belarus, Georgia, Moldova, Ukraine) with the score of Ukraine. The score of Ukraine 2017 is also provided for a reference. In general, Ukraine is clearly above the average and is therefore a good example for other EaP countries.

The following table provides more details about the open data barometer assessment in terms of environmental data (or related).

Table 5 - Open Data Barometer environmental evaluation (● - Yes, ● - No)

	Environmental data	Cartography	Health sector performance
Data exists	●	●	●
Online availability	●	●	●
Machine-readable	●	●	●
Reusable data	●	●	●
Free of charge	●	●	●
Open licence	●*	●	●
Data validity	●	●	●
Data update	●	●	●
Data discovery rating	●	●	●
Metadata	●	●**	●

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

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

The table here above nonetheless shows that Ukraine still has a lot to do in terms of data availability, update and metadata standards. In that regard, Ukraine could adopt an international metadata standard such as DCAT-AP and provide strict rules and procedures for the publication of Open Data.

Environmental Performance Index⁶²

⁶² <https://epi.envirocenter.yale.edu/epi-country-report/UKR>

The Environmental Performance Index (EPI) ranks countries on 24 performance indicators across ten issue categories covering environmental health and ecosystem vitality. These metrics provide a gauge at a national scale of how close countries are to established environmental policy goals. In 2018, Ukraine ranked 109 out of 180 countries with the score 52.87 out of 100. The figure below shows the main indicators of Environmental Performance Index.

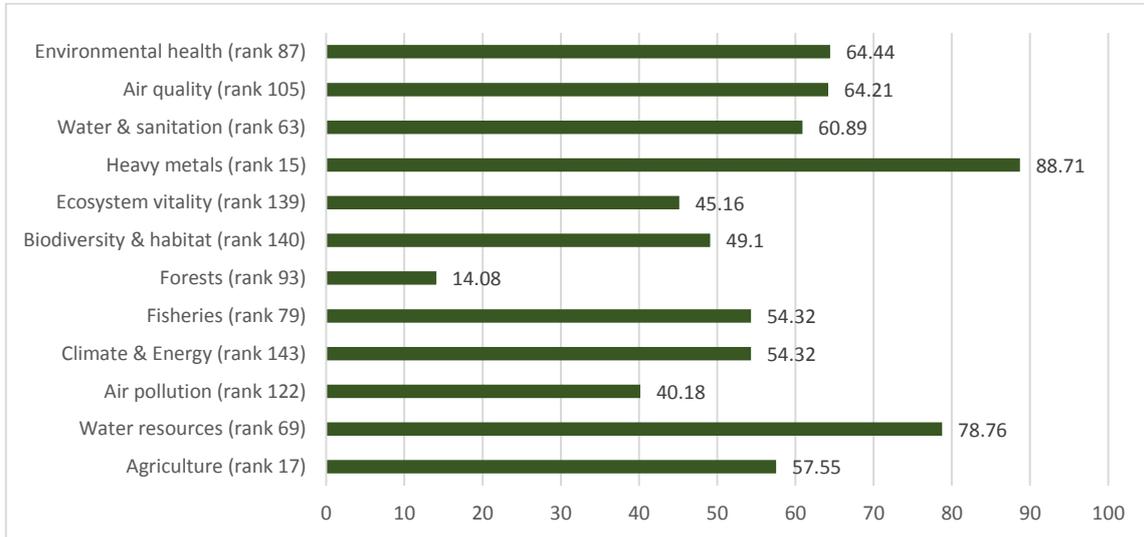


Figure 6 Indicators of EPI of Ukraine

3 Technology enablers for environmental information sharing

3.1 Portals

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

3.1.1 Open Data portal

The national open data⁶³ portal was created on the demand of the Law of Ukraine "On Access to Public Information" and the Resolution of the Cabinet of Ministers of Ukraine dated October 21, 2015, No. 835 "On Approval of the Provisions on Data Sets to be Released in the Form of Open data". The portal is intended to provide access to public information in the form of open data and provides for access to information of authorities with the possibility of its subsequent use. Any person may freely copy, publish, distribute, use, including for commercial purposes, in combination with other information or by including in its own product public information in the form of open data with the obligatory reference to the source of such information.

In 2014, the national open data portal was launched by PO SocialBoost⁶⁴ in cooperation with the Ukrainian government.

In August 2018, the new version of open data portal was created. The Open Data Portal was developed by the Opendatabot team within the framework of the USAID / UK aid project 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 DKAN platform to CKAN platform which is widely used for national open data portals. The new portal has a harvesting function that allows the portal to automatically take open data from other portals of cities or regions of Ukraine through the API if other portals allow it as well. In addition, it enables new functions for information managers to adjust the automatic updates of data. Data users have ability to preview the datasets prior download and give feedback through comments. The open data portal has the improved search of open datasets by allowing to filter data by administrator, manager level, 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 whether they will be transferred to the new platform. To this date, there are less than 20 datasets related to the environment and their categorisation is not based on UNECE indicators. The Ministry of Environment does not publish any environmental information on the portal, reflecting a potential lack of rules for the publication of environmental information.

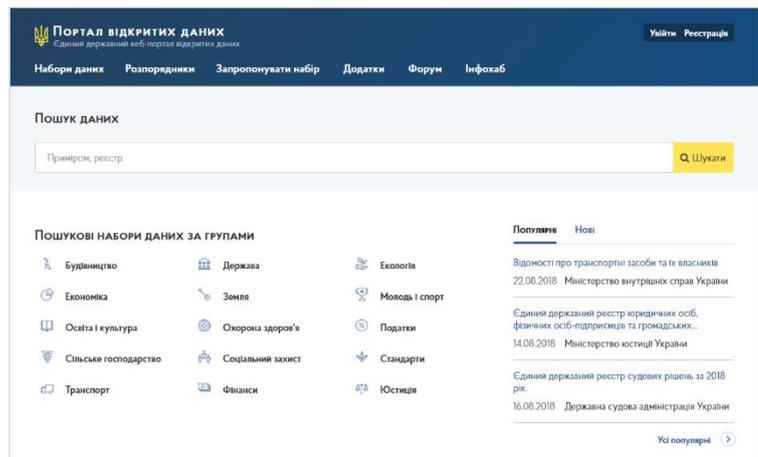


Figure 7 Ukrainian national open data portal

⁶³ <https://data.gov.ua/>

⁶⁴ SocialBoost is tech NGO in Ukraine. It is a platform where IT-enthusiasts, companies and government bodies work together to engage in socially meaningful IT projects.

3.1.2 Environmental portals

3.1.2.1 National platforms

Institutions	Evaluation
<p>State Statistics Service of Ukraine documents publishing http://ukrstat.org</p>	<p>The site UKRSTAT.ORG was created with the purpose of improving the usability of published documents and data of the State Statistics Service of Ukraine. National environmental reports and published on this website. However, data is published in the form of static tables and can only be downloaded in Excel format.</p> <p>The website is outdated and doesn't provide key information such as metadata and methodology used – even though defined as an obligation in the Law on Statistics.</p> <p>There is no mechanism to compare data between each other or across time.</p>
<p>MENR website https://menr.gov.ua/</p>	<p>In 1999, Ukraine ratified the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention). Access to information is provided by publishing information in official printed matter and on official Web sites, informational stands, and giving information to the public in response to official requests. However, not all information could be open by the state authority to public access, and there is a restriction on access to confidential information, and to secret and organisational information. The MENR publishes environmental information and the results of its work on the following Web site www.menr.gov.ua.</p> <p>However, some information is outdated. Any person and/or organisation may request information they need from the MENR by sending an official letter to the ministry.</p> <p>The MENR website is user friendly but the English version is poor and is not identical to the Ukrainian one.</p>
<p>Open Environment (eco-Portal)</p>	<p>Ukraine does not have a single standardised system that would display all environmental, weather and climate change data in user-friendly manner. However, currently the government started to develop the concept for national eco-portal (cf. section “Main initiatives”).</p>

3.1.2.2 International platforms

Shared Environmental Information System (SEIS)⁶⁵⁶⁶

The ENI SEIS II East website provides a recurrent assessment of UNECE environmental indicators reporting and national environmental reporting. More information is available here: <https://eni-seis.eionet.europa.eu/east/countries/ukraine>.

⁶⁵ <https://eni-seis.eionet.europa.eu/east/countries/ukraine>

⁶⁶ SEIS in Ukraine : <http://www.ukrstat.gov.ua/>

3.2 Portal maturity for environmental data

3.2.1 Statistics over availability of environmental data online

In Ukraine, environment data are published on multiple platforms. It is difficult to know which platform owns the data, and hence to know which dataset constitute the “version of the truth”.

Open Data portal

The Open Data portal evolved fast from a small collection of public datasets to become the primary source of public sector information. Currently, the portal consists of more than 35,000 datasets from almost 2,000 data providers. According to the open government partnership initiatives, much more work, however, remains to be done to fulfil the promise of open data. The low quality of data and a poor understanding of open data principles by government officials are the key issues to address.

The appendix 1 summarises the data published on the open data portal. In total, only a few datasets relate to the environment; a look at datasets under the sections “land” and “ecology” on the open data portal show no more than 20 datasets.

3.2.2 Re-usability of data

Open Data portal

Even though many datasets are available, only around a quarter of them are available in machine-readable formats. An additional 37% can be processed automatically (semi-machine-readable formats, i.e. txt, rtf).

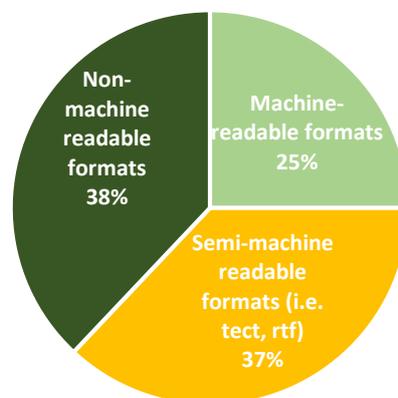


Figure 8 Formats of datasets in the Ukraine Open Data portal

During the Transparency and Accountability in Public Administration and Services program, 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 645/1090 on open data readiness (EU average: 597) and 160/250 on portal maturity (EU average: 161). The *Open Data Maturity in Europe 2016 report* groups countries according to their open data maturity, 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.

According to the Open Data Barometer, national environmental statistics⁶⁷ of Ukraine are available online⁶⁸. However, not all data is available in machine readable and reusable formats, is free of charge, is not openly licenced, is outdated and is not regularly updated, the information is difficult to find, and data identifiers are not provided for key elements in the dataset.

Datasets are available in Ukrainian and can be downloaded in Excel format. Usually, annual data are provided in separate files, so the comparison of yearly data can be complicated. In some cases, the metadata of data are published in English but the data themselves are in Ukrainian.

In addition, State Statistics Service publishes statistical yearbooks, including one on environment. Yearbooks can be downloaded in *.pdf* and *.xlsx* formats, however, most of information in the yearbook is provided in only Ukrainian.

⁶⁷ The Open Data Barometer doesn't provide information about the environmental data published, neither on the quantity.

⁶⁸ https://opendatabarometer.org/4thedition/detail-country/?_year=2016&indicator=ODB&detail=UKR

4 Achieving a high level of maturity for environmental information management

4.1 Main challenges

4.1.1 E-government

The major problems and challenges related to e-governance initiatives in Ukraine are presented in the table below.

Table 6 Major problems related to e-governance

<p>Content</p> 	<ul style="list-style-type: none"> • Lack of legal framework regulating the sphere of e-service delivery. Even though a set of important documents aimed at introducing e-services has been approved in Ukraine for the last several years, a systematic and integrate implementation of such services requires definitions for integrated rules, standards and formats in the sphere of e-services. A striking example of this problem 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 electronic service and does not share same quality standards as other electronic services in Ukraine. • Lack of minimum requirements to interoperability of state information resources. At the stage of design and development, public authorities should consider further electronic interaction of their systems with other ones by abiding minimum technical requirements. • Lack of integration of the environment in the e-government strategy: The absence of connection between environment initiatives with e-governance framework creates situations where environmental institution develop their own standards and platform. • Poor multilingual support: The absence of good translation on the e-service portal, and of most government websites undermines international collaboration.
<p>Infrastructure</p> 	<ul style="list-style-type: none"> • Poor quality of information systems at public authorities. Clear majority of information systems operable by public authorities were established with violations of the valid Law on designing, developing and operating as such, as well as violation of information security requirements. • Lack of integrated identifiers linking similar information from various state information resources (interoperability). This problem may cause serious difficulties at the state of establishment of organisational-legal and semantic interoperability of state information resources. • Ambiguity of standard requirements to e-interaction between state information resources (format, standard, procedure, etc.). Due to the lack of integrated approaches to implementing e-interaction, there are still created specific departmental or even regional projects to implement e-interaction systems that are incompatible with each other. Moreover, these projects can be often implemented technically first and only then legally approved, not the other way around.
<p>Network</p> 	<ul style="list-style-type: none"> • Low willingness level among civil servants and citizens to implement e-services According to various surveys and assessments related to e-readiness of Ukraine, there is a quite low understanding level of e-governance among both civil servants and citizens.

4.1.2 Open data

The major problems and challenges related to electronic access to information and open data are presented in the table below.

Table 7 Major problems related to open data

<p>Content</p> 	<ul style="list-style-type: none"> • Not always consistent implementation of open data initiatives Although the overall legislative framework represents a supportive environment for open data initiatives, significant parts of Laws and reforms are either very new or still in process, thus implementation is not always consistent. • Low maturity level of data published Most data are published under a low level of maturity and/or not in machine readable format. Therefore, the re-usability of these data is poor. In many cases, it is the old data in old format which is put under “open data” hat. • Poor multilingual support The absence of good translation on the open data portal, and in most government websites jeopardises international collaboration. • Lack of well-established/documented procedures on the quality assurance and quality control in data production workflow (including the documentation of the quality results that may provide valuable information to users; this information may be used to assess the usability or suitability for a given domain, application, project, etc.) • Lack of availability of the metadata documentation undermines re-use of Open Data.
<p>Infrastructure</p> 	<ul style="list-style-type: none"> • Lack of integrated approaches, rules, standards, technical Regulations in the sphere of electronic access to information and open data Actions of public authorities are not coordinated or sufficiently based from the technical and scientific point of view. As a rule, they do not correspond to the modern realities, as well as requests posed by both citizens and the business community. There are no coherent information management policies or standards for information and data security, data quality, including provenance, accuracy, timeliness and completeness consistently implemented across the government. There is no holistic view of databases and data hosted by the government. Some government data remains paper based, and machine-readable data is often not published even if it exists inside the institutions. Data sharing happens on a case by case basis and obtaining data is generally difficult and inefficient. • Lack of mechanisms and practices for data privacy protection The protection of privacy is regulated by Law but not all government agencies have robust mechanisms and practices to guarantee and safeguard the protection of privacy in practice. There are no anonymisation practices implemented across government agencies to safeguard the protection of personal data. • Departmental organisation of electronic access to state information resources. Public authorities define the way of access to information, their lists, number and frequency of publications, which causes enough differences within a plan for ensuring access to information at their sole discretion. • No government ICT interoperability frameworks exists There are no programs to support the development of integrated data assets and information exchange. As a result, both public authorities and agencies 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), but the

	<p>main problem is that they are not compatible with each other and use different technologies, standards and formats. All these lead to lack of coordination, variability and non-compliance use of state information resources, low efficiency and effectiveness, lack of flexibility of public governance. Actual information exchange lacks coordination, standardisation and interoperability.</p>
<p>Network</p> 	<ul style="list-style-type: none"> • Lack of efficient communications between public authorities, non-governmental organisations and economic agents <p>Public authorities are not very eager to implement tools of public monitoring surveys, inspection and surveillance over their activities for NGOs. As a rule, an initiative on communication building is boosted by representatives of non-governmental organisations.</p>

4.1.3 Environmental information sharing

The main problems related to environmental information management is presented in the table below.

Table 8 Major problems related to environmental information management

<p>Content</p> 	<ul style="list-style-type: none"> • The key gaps are identified in Ukraine’s strategy documents in the area of environment: lack of clear prioritisation among the different environmental goals and their associated monitoring and reporting (this lack undermines opportunities for implementation by failing to be responsive to financial and human resources scarcity); lack of a clear baseline and realistic target indicators; lack of clear time frames in the national plans of measures; and weak integration of environmental issues into sectoral strategies, programs, and activities. • Lack of user-friendly approach is one of the key challenges in sharing environmental information. It is hard for final user to know what is available and where. In this regards, it is basically only State Statistics Service which is providing information in a systemic consistent form. • Issues related to collection, production and update of the datasets in machine-readable formats • Copyright licences challenges and other barriers to sharing, public accessibility and re-use of environmental information
<p>Infrastructure</p> 	<ul style="list-style-type: none"> • The environmental management system underwent significant changes due to Law amendments that transferred a number of functions (such as permits for certain activities, monitoring, supervision, expert reviews, and so forth) from the central government (MENR) to local governments (oblast state administrations). The decentralisation process in Ukraine since 2014 is further complicating the situation by not offering and/or a single set of standards or rules for delivering certain services and providing access to relevant data at local (regional) level. Any further delegation of powers to local level authorities will require more efforts for establishing common framework on gathering and providing access to information relevant to the activities by local authorities. • Complex architecture for environment data exchange <p>Environmental data are published on multiple portals. In addition, SEMS is split among multiple entities.</p> <ul style="list-style-type: none"> • As no adequate ICT infrastructures exist, civil servants do not receive reasonable technical training. Substantial investments in ICT systems and capacity building are required.

	<ul style="list-style-type: none">• Old and insufficient infrastructure for environmental monitoring jeopardises the acquisition of data.
<p>Network</p> 	<ul style="list-style-type: none">• At present, each oblast has several agencies with responsibilities for natural resources, permitting, control, and enforcement – and there is no procedure outlining the coordination among them. Consequently, the system of environmental management at the sub-national level requires considerable effort to develop and organise, because legislative acts are not consistent; regulatory acts are often missing; and the functions of various agencies are not clearly defined, which results in gaps for some functions on one hand and overlap with the central level functions on the other hand.⁶⁹• The cooperation between Oblast State Administration (OSA) departments and oblast branches of State Ecological Inspectorate (SEI) is problematic because these two agencies belong to different authorities (regional and national). In addition, the recent abolishment of regional officers State Ecological Inspectorates might also undermine cooperation between the administrations.

⁶⁹ Ukraine Country Environmental Analysis, 2016, WorldBank.

4.2 Roadmap

This section presents key areas⁷⁰ of development for Ukraine. It is to be noted that these initiatives should be undertaken considering regional and international collaboration. Initiatives which were undertaken in other countries could be leveraged. In addition, the development of national standards would benefit if developed regionally and/or aligned to international standards. This especially is true for the design of information systems, metadata standards, portals and interoperability standards.

In addition, the following roadmap assumes that few elements are already in place for its smooth implementation. If some of these elements are not in place in the country, it is heavily recommended to first address issues related to these topics. In particular:

- Long term Digital and Open Data strategy: a national strategy and action plan for Open Data should be in place. It should ensure scoping, management and funding of the national Open Data portal, as well as that enough resources are allocated to open data awareness raising activities with both publishers and potential re-users.
- General interoperability framework: the country should have in place an interoperability framework or at least its foundation in place. This is especially required for building environmental information systems and ensuring smooth integration / exchange of environmental data.
- Open Data policy: the open data policy provides the foundation for a structured approach for public sector information dissemination.
- E-government, Open Data and geo-portals: the country should have effective e-government, open data and geo-portals on which environmental information can be shared / disseminated, and where services can be built.
- Environmental strategy: this strategy should contain key objectives for fostering sharing and dissemination of environmental information.
- Enforcement mechanisms for the collection, sharing and dissemination of environmental information.

Some of these measures are already in place in Ukraine (e.g. Open Data portal, etc.). Nonetheless, it is advised to look at these elements from a perspective of environmental information sharing and dissemination, and to update them where appropriate. It is to be noted that these elements are under continuous development and hence reviewed periodically.

⁷⁰ At this moment, the roadmap does not consider potential interdependences of measure and timeframe for their execution.

4.2.1 Content

Measure	Priority	Description
Revision of legal framework to promote accessibility and re-use of non-sensitive public sector information (PSI) online	High	Review of the legal framework for data governance related to environmental monitoring, decision-making and control, natural resources, ecosystems and pollution inventories and environmental assessments, in accordance with the Aarhus Convention, the Protocol on PRTRs (as appropriate). This can include: <ul style="list-style-type: none"> • improving environmental information system(s) by defining themes, sources (lists, registers, databases, funds, etc.), formats, metadata and interoperability requirements in accordance with the Aarhus Convention, Protocol on PRTRs, ECE environmental indicators and other international commitments and the e-government/open data framework • improving procedures for environmental data collection in electronic forms • improving procedures for environmental data update, quality assurance, reporting, online dissemination and other means of dissemination • proving public participation in the design, use and update of the environmental information system(s) of the and taking on citizens science and citizens engagement initiatives • division of responsibilities of the public authorities at all levels and across the sectors to ensure their clear roles and coordination • reviewing the application of the exceptions in disclosure of environmental information and establishing a clear and predictable legal framework to ensure the legitimate application of these exceptions and the disclosure of information on emissions in accordance with the Convention Setting out the requirement to separate non-confidential information of public importance for its further disclosure
		Adopt guidance defining the practical arrangements for environmental information management, sharing and dissemination: <ul style="list-style-type: none"> • scope of environmental information system(s) with their metadata description and registry (to be explained) • environmental data management system (data architecture, data stewardship, database administration, data privacy, data security, data quality) • decision-making procedure on non-confidential themes or datasets to be shared and published online and the relevant online portals (e.g. website of the public authority, environmental portals (one web access points for environmental information), geospatial portals, statistical, open data and other portals) • separation of non-confidential information as appropriate • data quality assurance mechanism
		stakeholder communication, including public participation procedure in the design, use and update of the environmental information system(s)
		Adopt an environment data policy: <ul style="list-style-type: none"> • Types and scope of environmental information available • Basic terms of availability and accessibility, including open access and sharing policy • Stakeholder care and support • Licensing standards Point of contact for access to environmental information

Measure	Priority	Description
Timely and regular collection and delivery of environmental data in accordance with the Aarhus Convention, the Protocol on PRTs (as appropriate) and the decisions and recommendations of the Meeting of the Parties to the Convention and the Protocol	High	Consider the possibility of accession to the Protocol on PRTs and define practical arrangements for establishing pollutant release and transfer registers within integrated environmental information system(s).
Definition of metadata description standard for all environmental information	High	This action will aim to define standards for the publication/exchange of environmental data and the publication of environmental reports. As a result, it will be easier for institutions to exchange and manage environmental data, while also making easier for citizens to find information. An example could be implementation of EU DCAT-AP standard, which would also enable integration with the European Data portal. Refer to the best practice report to get more information about metadata standards for Open Data.
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.	High	This action will review the existing standards for exchanging environmental data between institutions and systems and standardise the exchanges. This action is a prerequisite for building an effective central environmental information system.
Develop and publish quality control mechanisms for environmental data	Medium	This action will: 1. Assess the current quality control mechanisms from the collection (monitoring) of environmental data to the publication (aggregation, sorting, enhancement) 2. Provide a standard mechanism for quality control and set minimum standards to respect during the data flow (data gathering, data preparation and cleaning, data publication). 3. Provide the legal framework for setting obligations at different levels, and penalties in regards with quality controls of environmental data 4. Implement the quality control mechanisms and set up an annual reporting process for the evaluation of the quality of environmental data To implement these actions, refer to the best practice report to get examples.
Transformation of data published to machine-readable format	Medium	The true potential of environmental data lies in their usability. Ensure the publication of environmental data in machine-readable format.
Inventory, re-engineering and publication of public services as e-services	Medium	Ensure that environment services are described and accessible through the electronic service portal, in accordance with the national standards. For more information about the standardisation of the description of e-services and the development of an electronic service portal, please consult the best practice report.
Harmonise licensing terms and conditions of	Low	This action will harmonise all licensing terms and conditions on the different portals used for publishing environmental data. More

Measure	Priority	Description
environmental data to promote its public use and re-use		information about licensing are available in the best practice report.
Carry Open Data impact analysis framework in relation to the environment	Low	<p>Carry on the assessment of the impact of environmental data on the environment, as part of the open data impact assessment framework. For instance, evaluate the following criteria:</p> <ul style="list-style-type: none"> • Number of environmental data downloaded and re-used • User feedback received/collected • Apps developed using environmental data • Applications and apps developed using environmental data and having an impact on the environment (including re-use of environmental data in other disciplines, for instance transport). <p>More information about the general open data impact assessment can be found in the best practice report.</p>

4.2.2 Infrastructure

Measure	Priority	Description
Establish a single and user-friendly web-access point for environmental information	High	<p>Implementation of the concept of Open environment. Authorities should also consider which environmental data to publish to the “eco-portal”, and:</p> <ul style="list-style-type: none"> • Ensure the continuous maintenance of the access point through the execution of an action plan to ensure the portal’s sustainability over time • Increase the discoverability of environmental data and information by having : <ul style="list-style-type: none"> ○ a content-driven structure of the menu and ○ advanced search functionality that allow the user to use multiple field search and filter options (e.g. file format) to refine a search; combining the keywords with Boolean operators; ○ offer the possibility to download datasets ○ Specific “Request data” button ○ Public consultations for addressing environmental data demand <p>The design of the web-access point should be done through the public consultation on its functionality and design.</p> <p>More information about single access point can be found in the best practices report.</p>
Enhance Interoperability of geospatial, statistical, health and environmental information systems	High	<p>At the moment, different information systems and portals produce, consume and disseminate environment data. This action will:</p> <ul style="list-style-type: none"> • Undertake a comprehensive review of portals and information systems, including their interfaces and technological implementation • Provide standards for the design of systems consuming, producing or disseminating environmental data • Provide interoperability standard for exchange of environmental information between public information systems (e.g. health, environment, energy, and statistics) and provide external APIs for external data consumers.

		<ul style="list-style-type: none"> Provide mechanisms for consolidating environmental data across time and space <p>These actions can be also addressed within an overarching national interoperability framework. Refer to the best practices for more details about this action.</p>
Build an electronic registry of public environmental information	High	This action will aim to make a registry of environmental information available in each institution (i.e. metadata management system), and publishable considering the legal framework defined. This action could be coupled with the standardisation of metadata for environmental information as well as the definition of standard “environmental information” access points which would enable the registry to collect automatically this information. The registry will be used by public servants to support the continuous development of environmental information systems and the dissemination of environmental information. It will map systems, databases, institutions, datasets and reports published.
Improve accessibility and use of available environmental data and information by improving the multi-lingual aspect	Medium	This action will provide a full translation to English/Russian of public institutions websites, yearly reports and environmental information metadata. An example of multilingual portal is the GEMET ⁷¹ , which provides a thesaurus translated in 23 languages, including Russian.
Development of e-services for the environment	Medium	To describe the environment services according to the national standards (service passports) Development of environment services as e-services according to service interoperability standard (e.g. e-signature, e-payment). More information about the description of public services can be found in the best practices report.
Strengthening of technical capacity for environmental monitoring	Medium	Provision of modernised monitoring equipment.
Develop and/or continue to enhance an integrated system for environmental information management, including environmental information in accordance with the Aarhus Convention and the Protocol on PRTRs.	Low	Continue the integration as part of the Open Government concept.
Develop applications to engage citizens in environmental protection through technology, especially extending the scope of existing widely used one regarding meteo forecasts or citizens engagement tools	Low	This action should aim to create a series of apps and/or an “environmental data ecosystem” which would enable citizens to consult and interact with environmental data. For instance, through apps: <ul style="list-style-type: none"> consult environmental information in real time according their location public could report poaching, mark polluted areas, etc. public could take part into environmentally friendly events in their neighbourhood to fight pollution Integration of environmental data with popular national apps, where possible

⁷¹ <https://www.eionet.europa.eu/gemet/en/concept/4438>

4.2.3 Institutional Cooperation (Network)

Measure	Priority	Description
Establish a collaborative institutional framework for the implementation of an Open Data concept	High	This action will strengthen the necessary institutional framework for managing open data. This action will emphasis on the need to create a strong cooperation between institutions to ensure the publication of public sector information (PSI).
Continuously ensure availability of adequate capabilities for handling environmental and open data issues	Medium	This action will assess existing capacity of organisations for dealing with environmental information. It will continuously address methods, procedures, mandates, tools & technical maturity, skills and resources for handling environmental data.
Promote international and regional cooperation on good practices, challenges and lessons learned in the implementation of the points of this roadmap	Medium	Identify forums and meetings where experience can be shared.
Building capacity for environmental monitoring	Low	Provision of human resources for performing environment monitoring. Professional development/ training plan for civil servants and/or data stewards or data officers working with data (organised in the frame of the professional development programmes for civil servant). Capacity building – official training plan (Mandatory) for people responsible for data publication and recognised certifications for these people to increase the motivation and to be formally recognised as professional development training within the public bodies.
Develop a framework for measuring the social, political, environmental and economic impact of Open Data	Continuous	This action will further develop a framework for measuring the social, political, environmental and economic impact of Open Data. The framework will be tailored to take into consideration environmental data. Link to the study: http://tapas.org.ua/en/media/ekonomichnyi-potentsial-vidkrytykh-danykh-v-ukraini/
Implementation of policies regarding improvement of public awareness	Continuous	Raise public awareness on environmental information, its accessibility and related issues.
Raise awareness about open government and open data among the citizens and economic operators	Continuous	Driving demand for open government and data through greater awareness. Undertake a series of activities for promoting re-use and sharing of environmental information: <ul style="list-style-type: none"> • Hackaton • Forums • Promotion campaigns • Develop incubators • Develop public private partnership Develop cooperation between national bodies and NGOs and the academic sector

Appendix I: List of open datasets on the Open Data portal, snapshot of October 2018

- **Ministry of Health** – State register of Dangerous Factors.
- **Ministry of Energy and Coal**
 - Ecological and radiation situation in the location of nuclear power plants;
 - Balance of natural gas (operational data); Coal mining in Ukraine (for mines, product brands);
 - Gas production in Ukraine (operating data, by companies);
 - Extraction of oil and gas condensate in Ukraine (operational data, by companies);
 - Extraction and processing of uranium raw materials;
 - Natural gas reserves in underground gas storages (distribution of reserves for specific underground gas storage, percentage of filling);
 - Balance of natural gas (operational data);
 - Natural gas reserves in underground gas storage facilities (operational data);
 - Volume of natural gas supply to Ukraine (in directions);
 - Forecast of oil and gas complex development for the next year.
- **Ministry of Ecology and Natural Resources**
 - Register of environmental auditors and legal entities entitled to carry out environmental audits;
 - State Register of Pesticides and Agrochemicals Permitted for Use in Ukraine;
 - Data of regional registers of objects of formation, processing and utilization of waste of Ukraine;
 - State cadastre of wildlife;
 - State inventory of natural territories of resorts;
 - State inventory of territories and objects of the nature reserve fund;
 - Lists of licensees;
 - List of objects that are the largest contaminants in the natural environment;
 - Information about the heritage of the territory of Ukraine;
 - National ecological automated information and analytical system providing access to environmental information;
 - Data on state testing and registration of pesticides and agrochemicals;
 - Data of the state system of monitoring of the environment;
 - Data of the automated system of geoinformation control, monitoring and management of vehicles and personnel;
 - Data for the inventory of anthropogenic emissions and removals of greenhouse gases in Ukraine;
 - Information on the state of the environment (water, land, air, biodiversity);
 - The list of international agreements in the field of environmental protection, to which Ukraine is a party, and the state of their implementation.
- **State Service of Geology and Subsoil (Geonadar)**
 - Database of special permits for the use of subsoil;
 - Interactive map of subsoil sites, which are given special permits for the use of subsoil;
 - Objects for attracting investments;
 - Data of the state inventory of deposits and manifestations of minerals;
 - Data from the state inventory of underground water deposits;
 - Data of the register of oil and gas wells;
 - Data of the state balance of mineral resources;
 - Information on the state of the mineral-raw materials base of Ukraine;
 - Review geological maps.
- **State Water Agency**
 - General indicators of water resources use in Ukraine;
 - Data of state monitoring of surface waters.

- **Ministry of Agrarian Policy and Food of Ukraine**
 - State register of seed producers and seedlings;
 - Register of certificates for seeds and / or seedlings;
 - Information about certified forests of enterprises belonging to the sphere of management of the State Agency of Forestry;
 - Information about forest fires;
 - Forest monitoring data;
 - Register of Agricultural Advisers and Expert Advisors;
 - Register of agricultural advisory services;
 - Register of plantings of technical and table grape varieties in farms of all forms of ownership;
 - State register of subjects of tribal affairs in animal husbandry;
 - State register of technical means for the agroindustrial complex of Ukraine;
 - Fund of regulatory documents of the Ministry of Agrarian Policy;
 - Write-off of vineyards of all forms of ownership, which are laid out at the expense of state funds;
 - State books of breeding animals;
 - The only state register of animals;
 - State register of plant varieties suitable for distribution in Ukraine;
 - State register of breeding achievements in livestock breeding; Register of storage documents for grain and grain accepted for storage;
 - Information bank on soil condition of agricultural land;
 - Data on soil monitoring systems on agricultural lands;
 - Information on catches by species of fish in terms of reservoirs, administrative units, river basins.

- **State Agency of Forestry**
 - Database "Hunter";
 - Information from the State Forestry Cadastre.

- **Agency of Fisheries**
 - Information on the number of reservoirs in the directions and indicating the owners / tenants;
 - Information on the status and extent of fish stocks in industrial catchments;
 - Information on catches by species of fish in terms of reservoirs, administrative units, river basins;
 - Information on the volumes of the introduction of young (or fruit) fish - by species of fish in terms of reservoirs, administrative units, and river basins.

- **State Service of Geodesy, Cartography and Cadastre**
 - List of agricultural land plots of state property, the rights of which are planned to be sold on land trades;
 - Register of equipment of satellite radio-navigation systems;
 - State Register of Certified Engineers-Land Surveyors;
 - State register of certified engineer-surveyors;
 - Handbook of indices of normative monetary valuation of agricultural lands in Ukraine;
 - Indicator of indices of normative monetary valuation of settlements;
 - State register of appraisers on expert valuation of land plots;
 - List of types of documentation for land management;
 - Information on disposal of agricultural land of state ownership;
 - Information from the State Land Cadastre;
 - Information on land monitoring;
 - List of materials of the State Cartographic and Geodetic Fund.

- **State Statistics Service of Ukraine**
 - Directory of statistics sections;
 - Meta-descriptions of state statistical observations;
 - Quality reports;
 - Results of statistical observations (statistical information)