Dissemination of environmental information

Draft country maturity report: Belarus

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From: PricewaterhouseCoopers

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Terms and abbreviations

Term	Definition
CC	Creative Commons
EP	Eastern Partnership
EC JRC	Joint Research Centre of the European Commission
ECE	Economic Commission for Europe
ECS	European Cooperating States
EGDI	E-government Development Index
EITI	Extractive Industries Transparency Initiative
EPI	Environmental Performance Index
EU	European Union
EURDEP	European Radioactivity Data Exchange Platform
GIS	Geographical Information Systems
GPON	Gigabit Passive Optical Network
IAC	Information and Analysis Centre
IMF	International Monetary Fund
ITU	International Telecommunication Union
LTE	Long Term Evolution
MAF	The Ministry of Agriculture and Food
ME	The Ministry of Education
MENR	The Ministry of Ecology and Natural Resources
MF	The Ministry of Forestry
MHCS	The Ministry of Housing and Communal Services
MIAC	Main Information and Analysis Centre
MNR	The Ministry of Natural Resources and Environmental Protection
MNREP	The Ministry of Natural Resources and Environmental Protection
MOP	Meeting of the Parties
MPH	The Ministry of Public Health
MRF	Machine Readable Format
MT	The Ministry of Transport
NAS	The National Academy of Sciences
NEAP	The National Environmental Action Plan
NEMS	National Environmental Monitoring System
NSC	The National Statistical Committee
NSOs	National Statistical Offices

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Term	Definition
NTEC	National Centre for Electronic Services
ODIN	Open Data Inventory
POPs	Persistent Organic Pollutants
PRTR	Pollutant Release and Transfer Registers
RUE	The National Unitary Enterprise Belarusian Research Centre “Ecology”
SCP	The State Committee on Property
SDDS	Special Data Dissemination Standard
SDG	Sustainable Goal Developement
SEIS	Shared Environmental Information System
SI RCRCEM	State Institution "Republican Centre for Radiation Control and Environmental Monitoring"
SoE	State of Environment
UNFCCC	United Nations Framework Convention on Climate Change
UNITAR	United Nations Institute for Training and Research

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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.

In particular, 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.

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1 Executive summary

Belarus made the most significant progress of all EaP countries in terms of e-government and is now ranked 38th in the world E-government Development Index (EGDI, 2018). In regard with Open Data, Belarus ranked 57th according to the Open Data Inventory (ODIN) score (2017), and still requires to launch initiatives to foster publication of public sector information. In addition, Belarus is one of the two EP countries to be equipped with a National Environmental Monitoring System.

In terms of ICT statistics, the International Telecommunication Union has published the annual report "Measuring Information Society Report, 2017", and Belarus ranks 32nd. As such, Belarus is the leader in the development of ICT in the post-Soviet countries, even though the percentage of households with internet access remains low, at around 60% (2017).

A key challenge for the country is now to leverage on e-government and Open Data initiatives and to foster collaboration between environmental information holders in order to improve environmental information sharing and dissemination.

E-government

E-government in Belarus started in 2003, when the "Electronic Belarus" program for the informatisation of the country was adopted by the Government. Its objective was to build an information and telecommunication infrastructure, to digitalise governmental organisations, and to deploy help desks and register public (e-)services. Further developments were made possible thanks to the implementation of the national digital strategy "Belarus Informatisation Development Strategy 2016-2022" that sets, inter alia, the goal of over 75% of administrative procedures and public services to be provided in electronic format. The challenging objective for Belarus was to become one of top 50 countries on the UN E-Participation Index – objective met since Belarus is now 38th in the ranking. On the other hand, the "State Programme for the Development of the Digital Economy and Information Society for the period 2016-2020" sets out the rules for developing systems, which by default should be integrated with the Nationwide Automated Information System[1] in order to provide electronic services.

As such, Belarus is one of the most advanced EP country in terms of e-government. Further development of e-services, standardisation of exchange of information and metadata are nonetheless still required.

Open Data

The official Open Data portal has been recently released[2] and will be developed within the "State program for the development of the digital economy and the information society for 2016-2020". The official Open Data portal was delivered by the end of 2018 and currently has less than 50 datasets.

In parallel, Open Data are published on a non-official (Community) Open Data Portal. The portal is user-friendly but not available in English. Over 250 datasets have been published, but this number remains low compared to other EP or countries in the region. Besides, the portal has very few environmental datasets, and 30% of them are not available in machine-readable format.

[1] https://portal.gov.by/
[2] https://data.gov.by/

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Besides, the Law "On information, informatisation and protection of information" and overall legal framework for Open Data still needs improvements to standardise and ensure the quality and availability of data. Furthermore, the current legislation for the publication of public information requires to be refined in order to foster a concept such as "Open (Data) by default". To achieve this concept, institutions need to implement processes and tools to prepare and publish Open Data.

Environmental information

The quality of environmental legislation improved a lot in the last years by eliminating collisions and inaccuracies, creating clearer norms and improving their consistency with other legislative acts whilst taking into account practical constraints. In that sense, the approval of the Aarhus Convention has set a long-term trend to adjust the current legislation in the direction of ensuring the rights of the public to access environmental information. It is crucial to note the importance of the findings of the Compliance Committee of the Aarhus Convention[3] and decisions of the Meeting of the Parties (MOP) to the Convention, as they have triggered positive changes in the legislation.

Within the framework of environment monitoring, the state of the environment is monitored by various governmental organisations, and several separate databases and registers are maintained. In Belarus, environmental monitoring is being conducted under the National Environmental Monitoring System (NEMS) established in 1993. The NEMS developed and formalised the principles for environmental monitoring, environmental information structure. The NEMS also set the rules for environmental information exchange and dissemination, and can be considered as an example for countries lacking a central system for environment monitoring. In the same context, it is also to be acknowledged the development of GIS State Committee of Property (http://gki.gov.by/en/), which could in a near future enable the dynamic visualisation of environment data, time series and indicators on maps.

Nonetheless, the overall institutional framework involved in the collection and production of environmental information is one of the most complex of the EP countries. As a result, environmental information and data are published on multiple platforms, the main ones being the websites of the Ministry of Natural Resources and Environmental Protection, Belstat, the NEMS, the National Centre for Hydrometeorology, Control of Radioactive Pollution and Environmental Monitoring, and other specialised websites.

From a legal perspective, Belarus has still to improve its legislation for environmental monitoring and to continue enhancing environmental reporting and statistics. In this context, the Ministry of Natural Resources and Environmental Protection continues to introduce proposals to update existing legislation according to the country's international obligations. In 2007, provisions on access to environmental information were introduced in the Law on Environmental Protection, but a part of environmental information still remains outside the scope of this Law. Nonetheless, most of the legal provisions stemming from the international environmental agreements have already been transposed into the country national legislation.

[3] Belarus ratified the Aarhus convention through the Decree of the President of the Republic of Belarus of 14.12.99 No. 726 "On Approval of the Convention on Access to Information, Public Participation in the Decision-making and Access to Justice in Environmental Matters" on 9th March 2000.

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Main challenges

Belarus has succeeded in developing e-service and environmental information systems. Nonetheless, the country still lacks an official Open Data Portal. As such, it is crucial to finish the implementation of the Open Data portal, and to start implementing the legal, organisational and technical framework necessary to foster the publication of public sector information. In that regard, key challenges will be to enforce the obligation to publish public sector information whilst providing the tools and methods for dealing with restricted data.

The current legislation and organisational structure around environmental information is also complex. As a result, there is insufficient interaction between various public authorities and stakeholders involved in environmental sector and e-government institutions. Hence, a simplification of the organisational structure and/or strengthening the collaboration between the different actors and at different level could increase the availability, quality, and frequency of public information published.

In regard with monitoring and data collection, the system and methods of data collection are not fully harmonised with international classifications and requirements. Environmental indicators methodologies and legal bases for some indicators are also not finalised, and as such, tools and further work are required to ensure their presentation in a user-friendly format. A closer look at international classifications and the provision of clear methodologies to civil-servants would benefit the preparation, sharing, dissemination and re-use of environmental information. Besides, data processing and analysis can also be improved as there is a lack of data quality control and international mathematical models for data processing. In addition, there is no integration of environmental databases and information systems with the EU, which undermines sharing of environment data.

Finally, even though the country publishes a number of environmental data, there is still space for publishing more data, more frequently and on multiple platforms – including mobile applications.

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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 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

Electronic Belarus National Informatisation Programme

The initial objective of the Programme was to build an information and telecommunication infrastructure, to digitalise Government organisations, and to deploy help desks and registration services on electronic resources and systems operated by the State. The design and implementation of the e-government structure was further detailed in the "National Programme of Accelerated Development of ICT-based Services 2011-15". At the moment, Belarus is implementing the "Strategy on the development of informatisation in the Republic of Belarus for 2016 – 2022". In particular, in the context of this report, the main objectives are: increase Government transparency; improvement of the institutional framework and of legal Regulation of digitalisation processes, improvement of the national ICT infrastructure; foster digital communication; development and implementation of the State register of information systems; further development of electronic services; ensuring continuity, reliability, and security of information flows.

State Programme for the Development of the Digital Economy and Information Society for the period 2016-2020

The implementation of the next medium-term society informatisation stage is carried out in accordance with the Strategy on the development of informatisation in the Republic of Belarus for 2016 – 2022, approved by the Presidium of the Council of Ministers of the Republic of Belarus on November 3, 2015. In this regard, on March 23, 2016 the Decision of the Council of Ministers of the Republic of Belarus No. 235 approved the State Program on Development of Digital Economy and Information Society in Belarus for 2016-2020[4].

The Programme was launched in accordance with Belarus Informatisation Development Strategy 2016-22 and contains three sub-programs. One of them, the "Information infrastructure", aims at further implementation of e-government technologies. Its main goal is to improve efficiency and transparency of the State Regulation system through ICT solutions. Another sub-program, the "Information and communication infrastructure", includes measures for the creation and development of modern national information and communication infrastructure, platforms and services on the basis of modern ICT technologies. The last sub-program, the "Digital Economy", contains core projects that aim to provide efficiency gains for selected functions, and to increase labour productivity through the digitalisation of processes in all spheres of the national digital market. Additionally, the sub-program's

[4] https://mpt.gov.by/en/news/08-02-2017-1630

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framework includes the creation of a Belarusian integrated service and settlement system, the development of the State Electronic Control System[5].

In addition, the setup of the Open Data portal at national level is at the heart of the Programme. The Government of Belarus plans to launch a national portal by the end of 2018 as well as to create the legal foundation for further promoting Open Data principles and practices.[6]

Decree of the President of the Republic of Belarus of 8 November 2011 No. 515 "On some issues of development Information Society in Republic of Belarus"[7]

The Decree triggered the creation of the Council for Development of Information Society under the President of The Republic of Belarus. It describes its structure and main functions and also established 1) the functioning of the State system for managing public keys for electronic digital signature verification of the Republic of Belarus, 2) cryptographic protection of information that does not contain information related to state secrets, 3) interdepartmental information exchange of State bodies and other State organisations (in exception with information classified as state secrets), and 4) the operation and development of interdepartmental information systems.

2.1.1.2 Open data

The legal framework on Open Data is still very poor compared to other EP countries. It is necessary to review the current legislation to provide concrete mechanisms to share public information. In particular, the country misses a separate Open Data Strategy and Policy, which could enclose the basic principles, roles and responsibilities, tools and methods, licences, and procedures for the publication of Open Data.

Law of the Republic of Belarus, 10th ofNovember, 2008, No 455-3 "On information, informatisation and protection of information."

This Law regulates:

- Search, receipt, transfer, collection, processing, accumulation, storage, distribution and (or) provision of information, as well as use of information
- The creation and use of information technology, information systems and information networks, the formation of information resources
- Organisation and ensuring the protection of information

2.1.1.3 Environmental information

Environment legislation exists in many areas but its implementation needs to be developed further. Belarus makes particular efforts to make its legislation EU-compatible.[8]

Access to environmental information

In 2007, the amendments to the Law on Environmental Protection introduced the notions, types and sources of environmental information, as well as conditions for access to environmental information. The 2008 Law on Information, Informatisation and Protection of Information regulates general conditions for dissemination of information and access to information. The 2011 Law on the Requests

[5] Open keys control system, the national segment of Eurasian Economic Union integrated information system.
[6] Analytical Report: Open Data in the European Union Neighbourhood, page 14
[7] https://cis-legislation.com/document.fwx?rgn=47739#A3CZ0W473O
[8] ANNEX 1 of the Commission Implementing Decision on the Annual Action Programme 2015 in favour of the Republic of Belarus - Action Document for "Strengthening Air Quality and Environmental Management in Belarus".

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from Citizens and Legal Persons regulates general conditions and procedures for requests for information. The limitations on access to environmental information are provided by the Law on Environmental Protection, 2013 Law on Commercial Secrets, 2010 Law on State Secrets, 2011 Law on Copyright and Related Rights and other acts.

The "Environmental Strategy of the Republic of Belarus until 2025" defines the main principles and areas of environmental policy implementation in the country. The Strategy is spread over a five-year national environmental action plans for the rational use of natural resources and environment protection. Specific legislation has also been adopted, covering air quality, waste management and environmental protection.

The "Environmental Strategy of the Republic of Belarus until 2025" defines the main principles and areas of environmental policy implementation in the country. The key gaps identified in Belarus' strategy documents in the area of environment are: lack of clear prioritisation among the different environmental goals; low significance of environmental targets in government's development strategy; low level of independence of state environmental agencies; and weak integration of environmental issues into sectoral strategies, programs, and activities.

The Law of the Republic of Belarus, 26th of October, 1992, No 1982-XII "On Environmental Protection"

This Law establishes the legal basis for environmental protection, nature management, preservation and restoration of biological diversity, natural resources and objects and is aimed to ensure the constitutional rights of citizens to an environment that is favourable for life and health.

The Law of the Republic of Belarus, 18th of July, 2016 No 399-3 "On state environmental impact assessment, strategic environmental assessment and environmental impact assessment"

This Law regulates state environmental impact assessment, strategic environmental assessment and environmental impact assessment. It is aimed to ensure environmental safety and to prevent adverse environmental impacts.

The Resolution of the Council of Ministers of the Republic of Belarus, 19th of January, 2017, No47 "On some measures to implement the Law of the Republic of Belarus of July 18, 2016 "On State Ecological Expertise, Strategic Environmental Assessment and Environmental Impact Assessment"

The Resolution approves the Regulations on the procedure for carrying out state environmental impact assessment, including requirements for the composition of documentation submitted for state environmental impact assessment, the conclusion of state environmental impact assessment, the procedure for its approval and (or) cancellation, special conditions for the implementation of design decisions, as well as requirements for specialists, carrying out state ecological expertise.

Resolution of the Council of Ministers No. 734

The 2008 Resolution of the Council of Ministers No. 734 requires the holders of environmental information, such as the Ministry of Natural Resources and Environmental Protection, Ministry of Forestry, Ministry of Agriculture and Food, Ministry of Emergency Situations, Ministry of Education, State Committee on Property, State Inspectorate of Wildlife and Plants, National Academy of Sciences, local executive and administrative bodies, and other governmental organisations, to maintain registers of the environmental information they possess.

The Resolution also envisages the creation by the Ministry of Natural Resources and Environmental Protection of a consolidated register of environmental information which would include the list of environmental information available in the registers of holders of environmental information. In late 2014, the Ministry requested other state authorities to provide information for inclusion in the

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consolidated register. The consolidated register is available online.[9] The registry helps to search for environmental information, it indicates the organisation carrying out the type of activity, as a result of which a register of environmental information, the name of environmental information, the form of environmental information, and access conditions are formed.

Other major environment-related legislation

Table 1 - list of major environment-related legislation containing provisions on access to information

No	Title of the document	Date
1.	The Constitution of the Republic of Belarus	1994
2.	The Law of the Republic of Belarus "On Environmental Protection"	26.11.1992
3.	Decree of the President of the Republic of Belarus "On Integrated Environmental Associations"	31.01.1995
4.	Law of the Republic of Belarus On the Safety of Genetic Engineering Activities	09.01.2006
5.	The Resolution of the Council of Ministers of the Republic of Belarus "On approving the Regulation on the procedure for forming and maintaining the state fund of data on the state of the environment and impacts on it and the composition of general-purpose environmental information subject to mandatory distribution, holders of such information required to distribute it, and the frequency of its distribution"	24.05.2008
6.	The Law of the Republic of Belarus "On Local Government and Self-Government in the Republic of Belarus"	04.01.2010
7.	Decree of the President of the Republic of Belarus "About integrated environmental permits"	17.11.2011
8.	Resolution of the Council of Ministers of the Republic of Belarus "On some measures for the implementation of the Law of the Republic of Belarus" On introducing amendments and addenda to some laws of the Republic of Belarus on architectural, city-planning and construction activities "	06.06.2011
9.	Resolution of the Council of Ministers of the Republic of Belarus "On Approval of the Regulations on the Procedure for Conducting Public Ecological Expertise"	01.06.2011
10.	Resolution of the Council of Ministers of the Republic of Belarus "On measures to implement the Decree of the President of the Republic of Belarus of November 17, 2011 No. 528"	17.06.2011
11.	Decree of the Council of Ministers of the Republic of Belarus "On some measures to implement the Law of the Republic of Belarus of July 18, 2016" On State Ecological Expertise, Strategic Environmental Assessment and Environmental Impact Assessment	19.01.2017
12.	Resolution of the Council of Ministers of the Republic of Belarus "On the approval of regulations on the procedure for conducting a state safety review of genetically	12.06.2019

[9] http://minpriroda.gov.by/ru/new_url_857709135-ru/

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No	Title of the document	Date
	engineered organisms and approximate terms of contracts concluded for its conduct, and issuing permits to release non-pathogenic genetically engineered organisms into the environment for testing."	
13.	The Constitution of the Republic of Belarus	1994

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2.1.2 Main international policies and agreements

2.1.2.1 Multilateral Environmental Agreements with public access to information and reporting obligations

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

The Aarhus Convention establishes rights for the public (individuals and their associations) to access environmental information, participate in environmental decision-making and access to justice.

Belarus ratified the Aarhus convention through the Decree of the President of the Republic of Belarus No. 726 "On Approval of the Convention on Access to Information, Public Participation in the Decision-making and Access to Justice in Environmental Matters" signed on the 14th of December, 1999 and enforced since the 10th of October, 2001. The Convention sets 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 Belarus is reflected in national implementation reports for the Convention.[10]

In October 2014, the Deputy Prime Minister approved the Action Plan for Implementation of the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters for the period 2014-2017 with a view to streamlining implementation of the Convention.

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)

Belarus has not yet become a Party to the Protocol on PRTRs.

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 Belarus is reflected in national implementation reports for the Protocol on PRTRs.[11]

2.1.2.2 Other international forums promoting sharing and accessibility of environmental information

UNECE Environmental Performance Reviews[12]

To ensure sustainable development and monitoring progress in achieving sustainable development goals, a global 'data revolution' is necessary: to produce and share environmental data. 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

[10] https://aarhusclearinghouse.unece.org/national-reports
[11] https://www.unece.org/env/pp/reports_trc_implementation_2017.html
[12] https://www.unece.org/env/epr.html

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- Biochemical oxygen demand (BOD) and concentration of ammonium in rivers
- Nutrients in freshwater
- Protected areas
- Waste generation

Belarus is doing well with data production, however it needs to improve on meeting Indicator Guidelines on data structure for 5 out of the 8 indicators.

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.

EP Connect project

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 connect 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 creating of digital economies and promote Open Data in the EU Neighbourhood to the East. [13] The program was launched in July 2015.

2.1.2.3 Cooperation with the European Union

Declaration on Cooperation on Environment and Climate Change in Eastern Partnership[14]

In 2016, The European Union (EU) and Eastern Partnership (EP) countries adopted the Declaration on Cooperation on Environment and Climate Change. 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. Along with the above, the need for good environmental data in line with Shared Environmental Information System (SEIS) principles across the region, with experience shared through EEA and Eionet member states was also stressed in the text of the declaration.

On 9 October 2018 in Luxembourg, the Second Eastern Partnership Ministerial Meeting on Environment and Climate Change took place. The most important finding from the meeting were:

- Ministers agreed to keep the protection of the environment and climate change on the political agenda and to further develop and implement their actions and policies in line with the goals set in the EP Summit Declaration of 2017[15] and the Ministerial Declaration on Environment and Climate Change of 2016;

[13] EDP Analytical Report 7, Open Data in the European Union Neighbourhood, page 9
[14] http://ec.europa.eu/environment/international_issues/pdf/declaration_on_cooperation_eastern_partnership.pdf
[15] https://www.consilium.europa.eu/en/press/press-releases/2017/11/24/eastern-partnership-summit-joint-declaration/

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- Ministers also acknowledged the progress made by Eastern partners since 2016, in particular with policy planning, the ratification of the Paris Agreement and legislative changes and approximation, e.g. on water, air, green economy and environmental assessments.[16]

More information about the main achievements of Belarus can be found here: https://eeas.europa.eu/sites/eeas/files/eap_factsheet_belarus_eng_web.pdf

2.1.3 National standards, interoperability and data quality

2.1.3.1 Metadata standards

The following table presents the list of metadata standards used in Belarus:

Table 2 - metadata standards used in Belarus

Component	Metadata standards
Open Data	Official Open Data portal: N/A Non-official Open Data portal: the portal has metadata. It is not clear whether the metadata standard in use is DCAT-AP.
Spatial	Technical regulatory legal acts in the field of technical Regulation and standardisation of geodesic and cartographic activities are approved (shall be enacted) in accordance with the legislation on technical Regulation and standardisation.
Environmental information	Not published. In Belarus, environmental information standards are set by institutions responsible for the monitoring of specific environmental themes. Belarus is also applying various international standards, for example for monitoring of water.
Statistical metadata	The State Committee for Standardisation of the Republic of Belarus publishes a series of "Statistical classifiers" at the page: http://tnpa.by/#!/tabs/TnpaKindList/25. None of them concern the environment. In BelStat, environmental indicators provide narrow insight about the methodology used, which refers to the main protocol/agreement/legislation regulating the indicator. No further indication is provided.

[16] https://eeas.europa.eu/headquarters/headquarters-Homepage/52887/eastern-partnership-ministerial-meeting-environment-and-climate-change_my

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2.1.3.2 Quality control

Quality of data is ensured by standards. The general legal basis for standardisation in the field of environmental protection is made by the Laws of the Republic of Belarus “On Environmental Protection”, “On Technical Regulation and Standardisation”, “On Assessment of Conformity with the Requirements of Technical Regulations in the Field of Technical Regulation and Standardisation”.

Besides, the Law of the Republic of Belarus "On Environmental Protection", Chapter 5, aims to “Rationing, ensuring the uniformity of measurements, technical rationing and standardisation in the field of environmental protection. Environmental certification (extraction)”.

In particular:

- Environmental quality standards, standards for permissible impact on the environment, as well as other standards in the field of environmental protection are developed, approved and put into effect on the basis of modern science and technology, taking into account international rules and standards in the field of environmental protection.
- Standards for permissible emissions and discharges of chemical and other substances are established for stationary and mobile sources of environmental impact, based on standards for permissible anthropogenic pressure on the environment, standards for environmental quality, and technological standards.
- Technological standards are established for stationary and mobile sources, based on the best available technical methods and technologies, which ensure compliance with environmental requirements and taking into account economic and social factors.
- Measurements in the field of environmental protection are carried out by testing laboratories (centres) accredited in accordance with the legislation of the Republic of Belarus.

2.1.3.3 Interoperability

Environmental monitoring is carried out on the basis of the principle of reliability and comparability of environmental monitoring data. For example, currently, work is underway to harmonise waste legislation with relevant European legislation.

The Resolution of the Council of Ministers of the Republic of Belarus of March 23, 2016 No. 235 On approval of the State Program for the Development of the Digital Economy and Information Society for 2016–2020 specifies that State information systems are subject to mandatory integration with the national automated information system in order to provide electronic services. Interdepartmental interaction between State information systems will be carried out using the infrastructure provided in the appendix to the Decree of the President of the Republic of Belarus of November 8, 2011 N 515 "On some issues of the information society development in the Republic of Belarus".

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2.1.4 Institutional framework for environmental information managements and stakeholders' involvement

The following diagram illustrates the main environmental information, Open Data and e-governance institutions in Belarus.

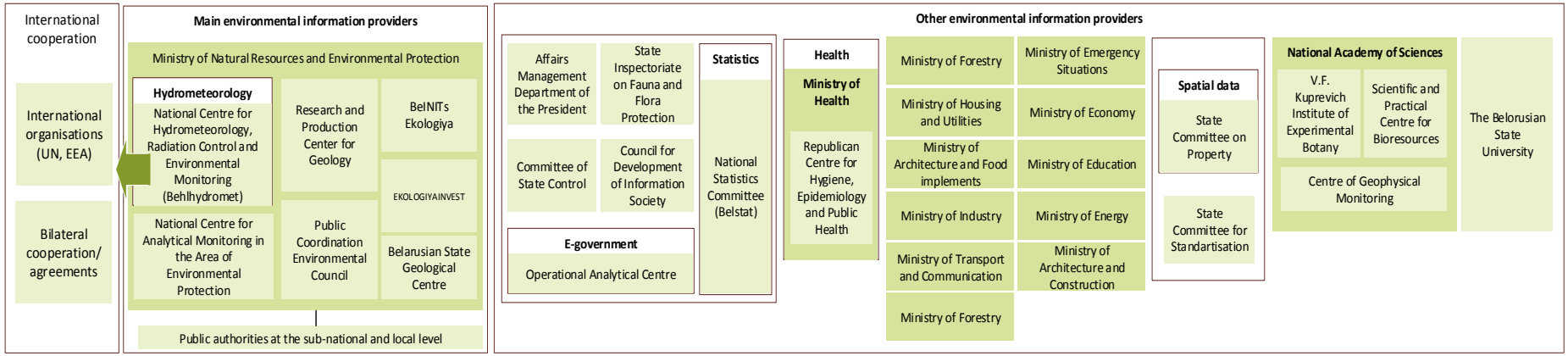

Figure 1 - Environmental information stakeholders

Ministry of Natural Resources and Environmental Protection - http://minpriroda.gov.by/en/

The Ministry of Natural Resources and Environmental Protection is in charge of the implementation of the consolidated State policy on environmental protection and rational use of natural resources. It is also responsible for the implementation of the State policy on the use and protection of subsoils and on hydro-meteorological activity. The Ministry coordinates activities on environmental protection and rational use of natural resources of other national authorities, local executive and administrative bodies. The Ministry has the following responsibilities regarding environmental information:

- Formation of the public data fund about the state of the environment and sources of impact upon it
- Provision of environmental information to the Republican bodies of state administration, local executive and regulatory bodies and citizens
- Promotion of environmental awareness, education and upbringing in the sphere of environmental protection

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Subordinated organisations to the Ministry of Natural Resources and Environmental Protection

Subordinated sectoral organisations are often entrusted with the substantive assistance within development of strategic and policy documents and national implementation reports. This results from the deep, specific knowledge of this type of institutions that operate under the scope of different central administration units. All subordinated organisations are State owned. Regarding environmental information, the following organisations should be mentioned:

- State institution National Centre for Analytical Monitoring in the Area of Environmental Protection – the main tasks of the Centre is environmental monitoring in the area of: pollution of air by stationary sources, mobile sources and companies; potential sources of land and water contamination; fuel composition. Another area of work of the Centre is participation in the implementation of international agreements[17].
- National Unitary Enterprise "Belarusian State Geological Centre" – the main task of the Centre is reception, systematisation and accounting of geological information that are held in the State Geological Fund of the Republic of Belarus. Also the Centre is responsible for selection and provision of information from the State Geological Fund to legal entities and individuals[18];
- Research and Development Enterprise "BelNITs Ekologiya" – environmental impact assessment and development of normative technical and methodological documents in the field of environmental protection[19].
- Centre of international environmental projects, certification and audit "EKOLOGIYAINVEST" – the Centre cooperates with legal entities and individual entrepreneurs to prevent environmental pollution. The organisation is also trying to improve the quality of environmental services by awarding certificates to distinctive units.[20]
- State Institution "National Centre for Hydrometeorology, Radiation Control and Environmental Monitoring "Belhydromet"[21] – it is a non-profit organisation that performs regular environmental observations and analysis. The main tasks of the centre are the collection, processing, storage, provision and dissemination of environmental information obtained through the National Environmental Monitoring System in the Republic of Belarus, as well as information received in the framework of the exchange of environmental information with the system of social and hygienic monitoring and monitoring and forecasting of natural and man-made emergency situations, to ensure the information needs of government agencies, government organisations, other legal entities and citizens. The main areas of work of the institution are:
    - Agrohydrometeorology - at present, agrometeorological observations in the republic are conducted by 45 observation points. Observation points conducting agrometeorological observations on the territory of the republic are arranged in such a way that they make it possible to cover the main agricultural areas of Belarus with agrometeorological observations and to have an idea of the conditions for the growth of crops throughout the territory. The stations conduct agrometeorological observations of 4-6 main crops (winter and spring cereals, rape, potatoes, flax, grass, etc.) with instrumental determinations of soil

[17] http://analitcentre.by/en/
[18] http://www.belgeocentr.by/
[19] http://www.ecoinfo.by/
[20] http://www.ecoinv.by/
[21] http://belgidromet.by/en/

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moisture in 3-5 fields. The results of agrometeorological observations form the basis of analytical agrometeorological information and agrometeorological forecasts. Generalized material from the entire state network of hydrometeorological observations is issued in the form of agrometeorological yearbooks.

- Radiation and Ecology - Belhydromet carries out activities in the field of atmospheric air monitoring, surface water monitoring, radiation monitoring, participates in land monitoring (chemical soil contamination on the territory of settlements and on background territories) within the framework of the functions assigned to it. Surface water monitoring is carried out at 297 observation points (at 86 watercourses, 53 lakes and 21 reservoirs). In the monitoring system of atmospheric air, observations are made of the content of pollutants in the air, precipitation and snow cover. Monitoring of atmospheric air is conducted in 19 industrial cities of the republic, including regional centres. Regular surveys cover the territories where 87% of the population of large and medium-sized cities of the country live.

- Territorial bodies: the territorial bodies of the Ministry are the Minsk City Committee of Natural Resources and Environmental Protection. They are composed of six oblast committees of natural resources and environmental protection, and 120 towns and district inspection units (sometimes joint town and district inspection units).
  The oblast and Minsk City committees and inspection units are subordinated only to the Ministry - they are not subordinated to local authorities in respective oblasts, districts and towns.
  They organise, in their respective territories, electricity and other power supply, water supply to the population, sewerage services, and the collection, transportation and disposal of municipal waste. Local executive and administrative bodies take decisions the declaration of protected areas of local importance and certain types of decisions on the use of land and natural resources.
  Local executive and administrative bodies are responsible for informing the public on environmental issues as a basis for public participation in the adoption of relevant decisions (for example, in the framework of public discussions of the Environmental Impact Assessment report or the draft local program for municipal waste management).
  The territorial bodies of the Ministry of Natural Resources and Environmental Protection are the closest link to the local community where environmental information can be obtained upon request.

Other environmental information providers:

- Republican Unitary Enterprise "Research and Production Centre for Geology" - http://geologiya.by/
  The Centre, which is part of the National Environmental Monitoring System in the Republic of Belarus, maintains a database of observations of the state of groundwater. It provides information obtained as a result of groundwater monitoring to republican government bodies, local executive and administrative bodies, scientific institutions, legal entities and citizens.
- Information and Analytical Centre for Atmospheric Air Monitoring: Monitoring of atmospheric air.
- State institution National Centre for Analytical Monitoring in the Area of Environmental Protection: Surface Water Monitoring; data are transferred to the central environment database.

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- The Belarusian State University: National Scientifically Research Centre for Monitoring the Ozonosphere, ozone monitoring.
- Scientific and Practical Centre of the National Academy of Sciences of Belarus on Bioresources: wildlife monitoring
- State Institution "Centre for Geophysical Monitoring of the National Academy of Sciences of Belarus": geophysical monitoring
- Republican Centre for Hydrometeorology, Control of Radioactive Contamination and Environmental: Monitoring radiation and environmental monitoring
- Republican Research Unitary Enterprise "Bel NIC" Ecology ": local monitoring of enterprises
- State institution "REPUBLICAN CENTER OF HYGIENE, EPIDEMIOLOGY AND PUBLIC HEALTH - http://minzdrav.gov.by/
  Subsidiary to the Ministry of Health, social and hygienic monitoring.
- Republican Centre for Management and Emergency Response - https://mchs.gov.by/
  Subordinate to the Ministry of Emergency Situations, monitoring and forecasting natural and man-made emergencies.
  It is responsible for the provision of State administrations and organisations subordinated to the Government of the Republic of Belarus, local executive and administrative bodies, with information about the threat or occurrence of emergency situations.
  Initially, the monitoring of emergency situations functioned with the composition of the National Environmental Monitoring System in the Republic of Belarus. In 2003, in accordance with the Resolution of the Council of Ministers of the Republic of Belarus of July 14, 2003 No. 949 "On the National System for Monitoring the Environment in the Republic of Belarus", emergency monitoring was excluded from the NEMS.
  On November 19, 2004, a resolution monitoring and forecasting system for emergencies was created by Resolution of the Council of Ministers of the Republic of Belarus No. 1466 in the Republic of Belarus.
- Public Coordination Environmental Council
  Since 2001, the Public Coordination Environmental Council of the Ministry of Natural Resources and Environmental Protection has provided the public and the Ministry with an important platform for dialogue.
- The Ministry of Forestry - http://www.mlh.by/
  The Ministry is entrusted with the monitoring[22] of forests.
- Other Sectoral Ministries

  In accordance with the Resolution of the Council of Ministers of the Republic of Belarus "On approving the Regulation on the procedure for forming and maintaining the state fund of data on the state of the environment and impacts on it and the composition of general-purpose environmental information subject to mandatory distribution, holders of such information required to distribute it, and the frequency of its distribution" the main owners of environmental information are the Ministry of Natural Resources and Environmental Protection, the Ministry of Forestry, the Ministry of Agriculture and Food, the Ministry of Emergency Situations, the Ministry of Education, the State Committee on Property, the State Inspectorate of Animals and Plants President of the Republic of Belarus, the National Academy of Sciences of Belarus, local executive and administrative organs. Owners of environmental

[22] Resolution of the council of ministers of the Republic of Belarus, March 16, 2004 № 298, "Questions of the Ministry of Forestry of the Republic of Belarus"

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information maintain registries and submit them to the Ministry of Natural Resources and Environmental Protection. Each ministry has a set of responsibilities to collect and share environmental information.

- The Ministry of Housing and Utilities: http://www.mjkx.gov.by/
- The Ministry of Agriculture and Food: http://www.mshp.gov.by/
- The Ministry of Industry: http://www.minprom.gov.by/
- The Ministry of Energy: http://minenergo.gov.by/
- The Ministry of Architecture and Construction: http://www.mas.by/
- The Ministry of Transport and Communications: http://www.mintrans.gov.by/
- The Ministry of Economy: http://www.economy.gov.by/ru/
- The Ministry of Education: https://edu.gov.by/

- The Ministry of Information: http://mininform.gov.by/

The National Statistical Committee (Belstat) - http://www.belstat.gov.by/

The National Statistical Committee of the Republic of Belarus (Belstat) is responsible for the State implementation of policy in the field of State statistics. Belstat is responsible for the Regulation and administration as well as coordination of statistical activities of other government agencies and other organisations. Belstat is subordinated directly to the President of the Republic of Belarus.

E-government and Open Data

The Ministry of Communications and Informatisation of the Republic of Belarus carries out government regulation and management of the activities in the domain of communications and Informatisation, coordinates the activities of legal persons regardless of their patterns of ownership and individual entrepreneurs in the domain of communications and Informatisation.

The Operational Analytical Centre is the State body that regulates activities of ensuring the protection of information containing State secrets or any other protected information.

The National Centre for Electronic Services - created under the auspices of the Operational Analytical Centre is responsible for the development of electronic systems, the e-government sector, development and maintenance of an interdepartmental document management system, development, implementation and operation of state e-services portal.[23]

Non-governmental organisations

The third UNECE Environmental Performance Review for Belarus[24] evaluated, among others, the presence of NGOs for environmental protection. In 2005 there were around 47 environmental NGOs in the country. The 2014 data of the Ministry of Justice counts of a cumulative number of 73 registered public associations active in "nature conservation, protection of historic monuments and culture" (i.e. not only nature conservation NGOs but also NGOs dealing with the protection of historic monuments

[23] https://bakutel.az/en-opennews/7156.41.html
[24] Environmental Performance Reviews, Belarus, Third Review, UNECE, 2016, page 35 (https://euagenda.eu/upload/publications/untitled-62378-ea.pdf)

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and culture). As of early 2015, there are no separate data on the number of environmental NGOs in the country.

The Aarhus Centre and NGO representatives concur in the estimates that there are about 30 national and not more than 10 local environmental NGOs registered in the country. This number is much lower than in other countries with a similar population (e.g. there are more than 2,000 environmental NGOs registered in Serbia).

Aarhus Centre of the Republic of Belarus

The Aarhus Centre of the Republic of Belarus operates in Minsk since 2005 and focuses on facilitating access to environmental information and raising awareness about the Aarhus Convention and promoting public participation in environmental decision-making.

2.2 Environmental data flow

The exchange of environmental information between institutions is based on the provisions of the Aarhus Convention, the relevant national legislation and - if necessary - on the basis of agreements between institutions.

The government bodies, local executive and administrative bodies of the Republic, legal entities have to take into account environmental monitoring data when developing forecasts of socio-economic development and making relevant decisions, developing programs and measures for the rational (sustainable) use of natural resources and environmental protection, location of production and other facilities, as well as use them to inform citizens about the state of the environment and measures for its protection.

National Environmental Monitoring System (NEMS) - http://www.nsmos.by

The National Environmental Monitoring System is the central system for environment monitoring in Belarus. The National Environmental Monitoring System established in 1993. Now National Environmental Monitoring System includes 12 independent environmental monitoring types based on the same principles:

- Land monitoring
- Surface water monitoring
- Underground water monitoring
- Air monitoring
- Ozone layer monitoring
- Flora monitoring
- Forest monitoring
- Fauna monitoring
- Radiation monitoring
- Geophysical monitoring
- Local environmental monitoring
- Complex ecosystem monitoring

The National Environmental Monitoring System aims to ensure the availability of environmental information at all levels of government as well as support the implementation of international agreements. The operation of the National Environmental Monitoring System is regulated by the 2003

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Resolution of the Council of Ministers No. 949 "On the National Environmental Monitoring System in the Republic of Belarus" and many other resolutions referring to the specific types of monitoring.

There are 12 types of monitoring in the National Environmental Monitoring System, performed by various institutions. There is an Information and Analysis Centre for each type of monitoring. The Interagency Coordinating Council oversees the functioning of the National Environmental Monitoring System and may request additional data or analytical information from institutions performing monitoring.

Exchange of environmental information goes through National Environmental Monitoring System, which contains data from the Main Information and Analytical Centre. The Centre was created in order to collect, process, store, provide and distribute environmental information obtained within the National Environmental Monitoring System in the Republic of Belarus, as well as information received in the framework of the exchange of environmental information with the system of social and hygienic monitoring, monitoring and forecasting of natural and environmental (man-made) emergencies, and ensuring the information flow to the government bodies, government organisations, other legal entities and citizens.

Individual Information and Analytical Centres maintain primary, aggregated and analytical information and data while the Main Information and Analysis Centre keeps aggregated, analytical and complex information and data. However, the exchange of information and data is basic and done through files sent by email in excel format. No protocols of data exchange are in place between Information and Analytical Centres and the Main Information and Analytical Centre. Data in most of the cases are replicated between Main Information and Analytical Centres and the Main Information and Analytical Centre. As for the publication of the data, it is not published raw, but in a processed format: the data is analysed and prepared by appointed experts, then reports on various topics are in turn published on Belhydromet portal. The reports are available only in Russian.

National statistics

In accordance with the Statute on the National Statistics Committee of the Republic of Belarus, approved by Decree of the President of the Republic of Belarus of August 26, 2008 No. 445, in which it is stated that the National Statistical Committee of the Republic of Belarus has the right to receive data, free of charge, from the State bodies and other organisations the information, as it is necessary for organising and conducting State statistical observations as well as the formation of official statistical information.

In accordance with the current Agreement on information interaction between the National Statistical Committee of the Republic of Belarus and the Ministry of Natural Resources and Environmental Protection of the Republic of Belarus of March 28, 2014, the Ministry of Environment provides Belstat with information free of charge in accordance with the annex to this Agreement.

Despite the progress achieved, some issues remain if Belarus is to be able to fully comply with the principles of SEIS, namely, the limitation of data flow and of protocols for data flow between National Environmental Monitoring System and environmental data systems. The situation is supposed to improve as of 2018, due to National Statistical Committee, the Ministry of Natural Resources and Environmental Protection signing an Agreement on information interaction.

Cadastres

Modern technologies, such as geographical information systems (GIS), are not fully used. For example, the register of National Environmental Monitoring System observation points was developed using GIS

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technologies but, since the links to the various databases are not in place, an update of the register is followed by manual actions to the Information and Analytical Centres and Main Information and Analytical Centre databases, and vice versa. Tools, such as forecasting systems on the environmental situation, which could help decision makers, are not developed. The lack of appropriate tools delays the assessment of the health of ecosystems.

The National Strategy of the Republic of Belarus for Sustainable Socio-Economic Development for the Period until 2030 states that one of the priority directions to ensure ecological sustainability should be further development of the National Environmental Monitoring System and control in the field of environmental protection with a view of pollution prevention or other negative impacts instead of neutralization of their effects.[25]

The Strategy for the development of hydrometeorological activities and activities in the field of environmental monitoring of the Republic of Belarus for the period up to 2030 was approved by the decision of the board of the Ministry of Environment.

The strategy determines the main directions of development, stages and activities, mainly aimed at ensuring the highest quality and reliability of information, increasing the efficiency of data acquisition and forecasting efficiency.

Collection and storage of environmental information: responsibility of the agencies of the Republic of Belarus

Table 3. Collection and storage of environmental information: responsibility of the agencies of the Republic of Belarus

	MNR	NSC	ME	NAS	MF	MHCS	SCP	MAF	MT	MPH
Atmospheric air and depletion of the ozone layer	■	■	■							
Climate change	■	■								
Water resources and water quality	■	■				■				■
Land and soil pollution						■	■			
Waste	■	■			■	■				
Radiation situation	■									
Forests and lands of the forest fund				■	■					
Biological resources, biodiversity, specially protected nature territories	■	■	■	■						

[25] http://abs.igc.by/wp-content/uploads/2016/09/Preservation-of-ecological-capital-for-future-generations-and-environment-improvement-1.pdf

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Transport	▪	
Agriculture	▪	▪
Energy	▪	

2.2.1 Environmental administrative information, statistics and assessment reports

2.2.1.1 Statistics and reports

Environmental assessment reports

Table 4 - Environmental assessment reports

Type of Report	Report?	Institution publishing the report
National environmental reports	Yes	According to the 2008 Resolution of the Council of Ministers No. 734, a national State of Environment Report is to be published every four years[26]. The report links the trends in the state of environment with policy measures undertaken. However, its conclusions and recommendations section lacks clear policy recommendations for the future on how to solve urgent environmental problems[27] and do not provide information on the process for the implementation of environmental dimension of Sustainable Development Goals. The National State of Environment Report is available in Russian. Link: http://minpriroda.gov.by/ru/nd/, http://www.minpriroda.gov.by/en/new_url_1244680181-en/ Other reports published on the Ministry of Natural Resources and Environmental Protection of the Republic of Belarus, on the webpage http://minpriroda.gov.by/en/nac_dokl-en/. • State of Environment In the Republic of Belarus • Environmental performance reviews • Comprehensive Environmental Evaluation (CEE) "Construction and operation of Belarusian Antarctic research station at the mount Vechernyaya, Enderby Land" (part 1, part 2, part 3, part 4, part 5) • STATE PROGRAMME for Development of Specially Protected Natural Areas for 2015 – 2019

[26] http://minpriroda.gov.by/en/nac_dokl-en/
[27] Environmental Performance Reviews, Belarus, Third Review, UNECE, 2016, page 41

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Type of Report	Report?	Institution publishing the report
		• NATIONAL STRATEGY FOR DEVELOPMENT OF THE SYSTEM OF SPECIALLY PROTECTED NATURAL AREAS UNTUL JANUARY 1, 2030 • Third Environmental Perfomance Review of the Republic of Belarus
Specialised reports - climate (national communications to UNFCCC)	Yes	United Nations Climate Change: https://unfccc.int/resource/docs/2013/arr/blr.pdf
Specialised reports - air	Yes	National monitoring system Environment: http://www.nsmos.by/content/173.html
Specialised reports - water	Yes	National monitoring system Environment: http://www.nsmos.by/
Specialised reports - biodiversity	No	National monitoring system Environment: http://www.nsmos.by/content/178.html
Specialised reports - waste	No	MNREP: http://www.minpriroda.gov.by/ru/otxody-ru/
Specialised reports - sustainable development	Yes	United Nations: https://sustainabledevelopment.un.org/content/documents/792belarus.pdf
Indicator-based reports	No	RUE: http://www.ecoinfo.by/content/691.html
National Statistical Yearbook	Yes	National Statistical Committee 'Belstat': http://www.belstat.gov.by/en/ofitsialnaya-statistika/publications/statistical-publications-data-books-bulletins/public_compilation/index_12543/
National Statistical Yearbook on environment	Yes	National Statistical Committee 'Belstat': http://www.belstat.gov.by/en/ofitsialnaya-statistika/publications/statistical-publications-data-books-bulletins/public_compilation/index_5113/

Reports can also be found on the ENI SEIS II East page[28] of the Republic of Belarus. The appendix 1 provides a complementary list of environmental reporting.

[28] https://eni-seis.eionet.europa.eu/east/countries/belarus

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General environmental information subject to mandatory dissemination

The following table presents the main environmental information disseminated:

Table 5. The structure of general environmental information subject to mandatory dissemination[29]

Structure of environmental information	Holder of environmental information	Frequency of dissemination	Method of dissemination
1. List of information contained in the general register of environmental information of the State data fund on the state of the environment and environmental impacts as well as the registers of environmental information of the state data fund on the state of the environment and environmental impacts	Ministry of Natural Resources and Environmental Protection and other state bodies and organisations that keep and store environmental information	Once a year	Presentation of information on information boards, displays, information is made available at the official websites of information holder;
2. Information on the radioactive and environmental situation in Belarus	Ministry of Natural Resources and Environmental Protection (SI RCRCEM)	No less than once in 7 days	Information is made available on the official websites of SI RCRCEM, Ministry of Natural Resources and Environmental Protection and in media
3. Information on excess of limits of pollutants emission/discharge into the environment	Ministry of Natural Resources and Environmental Protection (RUE) "Bel RC "Ecology"	Once a quarter	Information is made available on the website of the MIAC of the NEMS; publication of the information bulletin
4. Information on the concentration of total nitrogen, ground layer ozone and UV index	National SRC for Ozone Sphere Monitoring of the Belarusian State University	Once in 7 days	Information is made available at the website of the National SRC for Ozone Sphere Monitoring of the Belarusian State University
5. Information on the environmental situation in the Republic of Belarus	Ministry of Natural Resources and Environmental Protection	Once a year	Publication of the environmental bulletin "State of the Environment in Belarus"

[29] This table has been built based on "The Republic of Belarus Country Report, European Environmental Agency, 2012, page 36".

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Structure of environmental information	Holder of environmental information	Frequency of dissemination	Method of dissemination
6. Information on the environmental situation in the Republic of Belarus, its trends, use of natural resources and State policy in the sphere of environmental protection	Ministry of Natural Resources and Environmental Protection	Once in 4 years	Publication of the National State of the Environment Report of the Republic of Belarus
7. Information on the state of the environment on the basis of monitoring conducted within the framework of the National Environmental Monitoring System of the Republic of Belarus	Ministry of Natural Resources and Environmental Protection (RUE "Bel RC "Ecology")	Once a year	Information is made available on the website of the MIAC of the NEMS in the Republic of Belarus; publication of the annual review "The National Environmental Monitoring System of the Republic of Belarus: Results of Observations"
8. The list and a short description of rare and endangered species in Belarus, including subspecies, varieties of wild plants and animals; information on their habitats, biology, numbers and trends, main threats, conservation measures, as well as international and national nature conservation importance of wild plants and animals	Ministry of Natural Resources and Environmental Protection	No less than once in 10 years	Publication of the Red Book of the Republic of Belarus

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2.2.1.2 Indicators

Indicators monitoring

In 2010, in accordance with the Guidelines for the Application of Environmental Indicators in Eastern Europe, Caucasus and Central Asia (now referred to as Online Guidelines for the Application of Environmental Indicators, ECE), Belstat, together with the Ministry of Natural Resources and Environmental Protection, Ministry of Housing and Utilities and State Committee on Property, developed and approved the "System of core environmental indicators of the Republic of Belarus".

Belarus adjusted its environmental indicator system in line with UNECE guidelines and gradually widens a range of data provided in accordance with the SEIS principles.[30] Indicators are comparable at the international level and available in Russian and English. As from 2015, Belarus publishes information for indicators of air protection, ozone layer depletion, climate change, water, biodiversity, waste, application of fertilizers, passenger turnover, and energy. For each indicator, the system includes information on the unit and methodology of measurement, source of information and importance of the indicator for environmental policy. The system is available on the Belstat webpage.[31]

As part of the ENI SEIS II East project, in 2018, with the support of experts from the European Environment Agency, work was carried out in such areas as water resources, biodiversity, atmospheric air, preparation of a national report on the state of the environment, and communication in the field of the environment. Therefore, as part of the work on water resources statistics, in accordance with international recommendations, tables of SEIS indicators on the availability, production and use of water resources (C1-C5) were developed and presented on the Belstat website. In addition, work continues on the formation of metadata files and analytical information on indicators C1-C5, as well as the analysis of the tables of water resources and the use of water resources for 2016 and 2017.

As part of the work on biodiversity statistics, tables of the SEIS indicator on specially protected natural areas (D1) were developed and also presented on the Belstat website. Work on the formation of metadata files and analytical information on the indicator continues. The results of the work done have simplified access to environmental indicators for users, as well as the process of filling in international questionnaires.

It is to be noted that the Statistical system in Belarus is less advanced than some others EP countries, such as Moldova and Armenia.

[30] Shared Environmental Information System and Green Growth. Regional workshop for the countries of Eastern Europe, the Caucasus and Central Asia. OECD Headquarters, Paris, France, 10-11 March 2015

[31] Environmental Performance Reviews, Belarus, Third Review, UNECE, 2016, page 39

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National Statistics Committee (Belstat)

The State Statistics Service provide this description of environment statistics.

Table 6. National environment statistics

Environmental component	Basic statistical indicators	Statistical products
Protection of atmosphere air – Obtain data on emissions of pollutants and greenhouse gases into the atmosphere air by stationary sources of pollution	• Emissions of pollutants into the atmospheric air in total, from stationary sources, and from mobile sources • Emissions of pollutants into the atmospheric air by selected ingredients • The number of days during a year when air pollution levels (for selected pollutants) exceed the established limit values • Total amount of ozone depleting substances and in the context of individual substances	**Statistical abstracts:** • Belarus in Figures • Environmental protection in the Republic of Belarus • Regions of the Republic of Belarus • Social Standing and Living Standards **Statistical information on the site:** • Emissions of pollutants into the atmospheric air in total, from stationary sources, and from mobile sources • Emissions of pollutants into the atmospheric air by economic activities • Emissions of pollutant substances into the air by stationary sources of pollution
Generation and treatment of wastes – Obtain data on generation and treatment of wastes	• Generation of waste, generation of waste per one 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	**Statistical abstracts:** • Belarus in Figures • Environmental protection in the Republic of Belarus • Regions of the Republic of Belarus • Social Standing and Living Standards **Statistical information on the site:** • Basic indicators of treatment of wastes (2005-2017) • Generation and utilization of wastes by category of materials; Treatment of household and similar wastes in Belarus in 2005-2017 • Wastes generation by type of economic activity, Generation and treatment of wastes by classification grouping of the state wastes classification

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Environmental component	Basic statistical indicators	Statistical products
		• Statistical information/ multisector statistical information/ Regional statistics/ Environment • Hazardous waste management
Expenditure for protection of environment and ecological expenditure costs – Obtain data on expenditure for protection of environment and provision of ecological services	• Expenditure for environmental protection • Capital investment into protection of environment • Expenditure for capital repair of fixed assets intended for nature protection purposes • Funds paid for the provision of ecological services	**Statistical abstracts:** • Statistical yearbook of Belarus • Regions of the Republic of Belarus • Environmental protection in the Republic of Belarus **Statistical information on the site:** • 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

2.2.2 Environmental data sharing arrangements

The holders of environmental information keep registers that are included into the general register of environmental information of the State data fund on the state of the environment and environmental impacts developed by Ministry of Natural Resources and Environmental Protection. Holders of environmental information communicate their registers to Ministry of Natural Resources and Environmental Protection on an annual basis, but not later

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than the 1st of October. Ministry of Natural Resources and Environmental Protection ensures the publication of the general register in hard copy and makes the information of the general register available on its official website.[32]

Most often, the obligations and the procedure for transferring environmental information are contained in the Regulations on the information owner or in the Regulations on the information resource. General approaches and rules for the collection, storage and dissemination of digital information are contained in legal documents at the national level. According to experts, some information is available in machine-readable and reusable formats. This is confirmed by the Open Data barometer.

The below table describes the main actors in the environmental data sharing and the flow of environmental information between them.

Table 7. Inter-institutional cooperation for environmental data exchange[33]

Institution	Component of the environment	Inter-institutional cooperation for data exchange
The Ministry of Natural Resources and Environmental Protection http://minpriroda.gov.by	Natural Resources Waters Animals Air Plants Soils and landscapes Waste Climate	The Ministry conducts regular exchange of environmental information with below state and governmental bodies: The Ministry of Health The State Inspectorate on Fauna and Flora Protection under the President The Ministry of Forestry The Ministry of Agriculture and Food implements The Ministry of Housing and utilities The National Academy of Sciences of Belarus The Ministry of Foreign Affairs The Ministry of Internal Affairs
Department for Geology of the Ministry of Natural Resources and Environmental Protection http://depgeo.org.by/index.php	Soils Geology Minerals	The Department cooperates closely with the State Property Committee

[32] The Republic of Belarus Country Report, European Environmental Agency, 2012, page 36
[33] This table will be completed during 2019.

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Institution	Component of the environment	Inter-institutional cooperation for data exchange
Department for Hydrometeorology of the Ministry of Natural Resource and Environmental Protection http://www.belgidromet.by/ru/	Atmospheric air Surface waters Radiation	The National Academy of Sciences of Belarus The scope of environmental information exchange is determined by The Resolution of the Council of Ministers of the Republic of Belarus of 6 October 2006 №1316 "On the approval of the Provision on procuring hydrometeorological information of civil aviation in the Republic of Belarus". Agrometeorological observations are used in: - Assessment of agroclimatic resources of Republic of Belarus in conditions of modern climate change - Long-term planning of agricultural production - Adjustment of current activities in agriculture to variable atmospheric conditions - Development of measures for rational use of favourable agroclimatic conditions and overcoming the harmful ones. - Development of methods for agrometeorological forecasts - Scientific research
The Ministry of Natural Resources and Environmental Protection http://minpriroda.gov.by Information Analytical Centres Through the National Environmental Monitoring System www.nsmos.b	Soils and landscapes Waters Air Fauna Flora Waste Radiation Geology	In accordance with the Resolution of the Council of Ministers of the Republic of Belarus of July 14, 2003 No. 949 "On the National Environmental Monitoring System in the Republic of Belarus", the NEMS interacts with the system of social and hygienic monitoring and the system of monitoring and forecasting natural and man-made emergencies. The exchange of environmental information between these systems is carried out free of charge in the manner determined by the Ministry of Natural Resources and Environmental Protection together with the Ministry of Health and the Ministry of Emergency Situations (para.7). The NEMS provides information exchange, provision of environmental information to State bodies, other State organisations, other legal entities and citizens, and international organisations in accordance with international treaties of the Republic of Belarus (para.10).

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Institution	Component of the environment	Inter-institutional cooperation for data exchange
Research and development enterprise RUP BelNITs Ekologiya http://www.ecoinfo.by/	Soils and landscapes Waters Air Fauna Flora Waste Radiation Geology	The RUP is in charge of preparation of documentation to fulfil the obligations of the Republic of Belarus on the UN Framework Convention on Climate Change and the Kyoto Protocol, as well as maintaining of the State air inventory. The RUP is in charge of maintaining the registers of facilities for the use, disposal, burial and storage of waste.
Central Research Institute for Integrated Use of Water Resources http://www.cricuwr.by/	Waters	Development of databases, information systems and management decision support systems in the field of the State Water Cadastre.
RUP Belarusian State Geological Centre http://www.belgeocentr.by/	Geology Soils Land~~s~~	The web-application "The Catalogue of State Geological Fund reports" is designed to provide remote access via the Internet to the consolidated electronic catalogue of the State Geological Fund documents — reports on the geological study of the subsoil, containing geological information on regional, prospecting, exploration and research works in the territory of the Republic, to simplify the preparation procedures and filing an application for the provision of geological information for use in the State Geological Fund.
Information-Analytical Centre of Atmospheric Air Monitoring http://rad.org.by/monitoring/air	Atmospheric air Atmospheric precipitation Snow cover	Description of the observation network and its scheme (scheme in Minsk): -Atmospheric air condition -Information on exceeding the standards of air quality last week -Criteria for assessing the state of atmospheric air -Archive of data on the state of atmospheric air in Belarus
The Ministry of Agriculture and Food https://www.mshp.gov.by	Surface waters Soils Plants Animals	The Ministry exchanges materials with the Institute of the Scientific and Practical Centres of the National Academy of Sciences of Belarus concerning: -Agriculture -Fauna
The Ministry of Forestry http://www.mlh.gov.by	Soils Forest vegetation Fauna	The RadFor Information System is a synthesis of geographic information system, database management system and decision support system.

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Institution	Component of the environment	Inter-institutional cooperation for data exchange
		All information about the radioactive contamination of forest land are stored in the Radiation Situation database. The information obtained as a result of data analysis is submitted to the interested Ministries and departments, as well as to organisations and business entities subordinate to them.
Ministry of Energy http://minenergo.gov.by/	Coal Petroleum	The major part of environmental information is published and exchanged by the Nuclear Power Plant (NPP) Information Centre. The major task of NPP Information centre is to inform the population about nuclear power engineering and its objects, about the nature of nuclear energy and the principles of NPP work.
State Institution “The Republican Hydrometeorological Centre” http://www.hmc.by	Water objects and water bodies Surface waters Irrigated and drained lands Submergence area	In 2015, the State Institution "Republican Hydrometeorological Centre" and the State Institution "Republican Centre for Radiation Monitoring and Environmental Monitoring" were reorganised in the form of a merger into the State Institution "Republican Centre for Hydrometeorology, Control of Radioactive Pollution and Environmental Monitoring" (Hydromet). The organisation provides State bodies, other organisations, sectors of the economy and the population with all kinds of hydrometeorological and radiation-ecological information. The Institution also participates in interstate exchange of information on the state of the environment in accordance with the recommendations of WMO and UNESCO and implements active access to environmental information.
Centre of Geophysical Monitoring of the National Academy of Sciences http://cgm.org.by/	Ground waters Endogenic and exogenic processes Geophysical fields Landscapes	The Centre for Geophysical Monitoring of the National Academy of Sciences of Belarus carries out operational cooperation with the Ministry of Emergency Situations of the Republic of Belarus (Republican Centre for Management and Response to Emergencies), the Ministry of Natural Resources and Environmental Protection of the Republic of Belarus and other interested departments on the occurrence of natural hazards and possible prevention of their negative consequences. The summarised information is annually transmitted to the Main Information and Analytical Centre of the National Environmental Monitoring System of the Republic of Belarus. The Centre carries out scientific support, conducts engineering and geophysical work on the study of seismic conditions and the assessment of the degree of seismic hazard

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Institution	Component of the environment	Inter-institutional cooperation for data exchange
		in the areas of construction and the location of particularly important industrial and civil facilities in Belarus. Upon request, the centre provides information on the geomagnetic situation to the interested departments. The Centre actively cooperates with the media. The Centre also cooperates with various research organisations of the National Academy of Sciences of Belarus and educational institutions (Belarusian State University, Polotsk State University, etc.).
National Statistical Committee http://www.belstat.gov.by	Atmospheric air Sources of emissions Surface waters Climate Biodiversity Soil Sources of discharge Land resources Forest resources Reserved territories and game areas Waste	The list of State bodies (organisations) with which agreements on information interaction are concluded (including environmental): - Operational Analytical Centre under the President of the Republic of Belarus; - Ministry of Architecture and Construction of the Republic of Belarus; - Ministry of Housing and Communal Services of the Republic of Belarus; - Ministry of Health of the Republic of Belarus; - Ministry of Foreign Affairs of the Republic of Belarus; - Ministry of Information of the Republic of Belarus; - Ministry of Emergency Situations of the Republic of Belarus; - Ministry of Forestry of the Republic of Belarus; - Ministry of Education of the Republic of Belarus; - Ministry of Taxes and Duties of the Republic of Belarus; - Ministry of Natural Resources and Environmental Protection of the Republic of Belarus; - Ministry of Communications and Information of the Republic of Belarus; - Ministry of Agriculture and Food of the Republic of Belarus; - Ministry of Sport and Tourism of the Republic of Belarus; - Ministry of Transport and Communications of the Republic of Belarus; - Ministry of Finance of the Republic of Belarus; - Ministry of Economy of the Republic of Belarus; - Ministry of Energy of the Republic of Belarus; - Ministry of Justice of the Republic of Belarus; - State Property Committee of the Republic of Belarus;

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Institution	Component of the environment	Inter-institutional cooperation for data exchange
		- State Committee on Science and Technology of the Republic of Belarus; - State Committee for Standardisation of the Republic of Belarus; - State Border Committee of the Republic of Belarus; - State Control Committee of the Republic of Belarus; - National Academy of Sciences of Belarus; - Republican centre for health improvement and sanatorium-resort treatment of the population.
Ministry of Emergency Situations Http://mchs.gov.by	Atmospheric air Surface (including marine) waters Ground waters Soils and landscapes Radioactive waste	Transmits to State bodies relevant information for their activity.
Ministry of Public Health www.minzdrav.gov.by	Air Water	In 2005, the Ministry of Natural Resources and Environmental Protection, Ministry of Health and Ministry of Emergency Situations agreed to exchange, regularly and free of charge, environmental information between the National Environmental Monitoring System, the system of social and hygiene monitoring and the system of monitoring and forecasting of natural and man-made disasters. Some information is exchanged on a monthly basis, while other information is on a quarterly or annual basis. Exchange of information among the three systems functions also at local level, for example, there are agreements on exchange of information between oblast centres for hydrometeorology and environmental monitoring and oblast centres for hygiene, epidemiology and public health.
State Committee of Property http://gki.gov.by/en/	Lands	The State Committee of Property cooperates in preparation of gismap.by - Public Land Information Map of Belarus

Exchange with the EU

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The work of the EU and Belarus experts on the development of EU-Belarus cooperation priorities for 2014-2020 in the framework of the National Program of the European Neighbourhood Instrument was conducted. One of the strategic priorities of the Cross Border Cooperation Program is "The current challenges in the field of environmental protection, health and safety". The exchange of environmental information takes place mainly in the framework of international technical assistance projects. Therefore, in the framework of the European Neighbourhood Instrument and Partnership 2014-2020, the Latvia-Lithuania-Belarus Cross-Border Cooperation Program is being implemented.

Besides, 39 European countries also share radiological data from national monitoring networks within the EURDEP system[34]. The EURDEP database is located at the Institute for Transuranium Elements of the Joint Research Centre of the European Commission (EC JRC), Ispra, Italy. Since 2015, the Republic of Belarus has been participating in the exchange of radiological data with the EURDEP.[35]

[34] https://eurdep.jrc.ec.europa.eu
[35] http://rad.org.by/articles/radiation/radiacionnaya-obstanovka-v-evrope.html

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2.2.3 Licencing norms

The following table presents the main websites where environmental information is published:

Table 8 - Licencing norms per main portal

Institution and portal	Copyright licencing
Open Data portal	No information on license is available on the official Open Data portal. On the non-official Open Data portal, the content is provided under the Creative Commons Attribution 4.0 International License, unless otherwise noted. The content licensed this way may be processed freely and used by both individuals and legal persons.
EURDEP	All data that is exchanged via EURDEP are subject to copyright of the original data provider and cannot be used for other purposes, including scientific research, without their prior written agreement.[36]
NEMS www.nsmos.by	There is section "licence" on the website, but its content is empty.

General rules set out by the Law "About information, informatisation and protection of information":

- The rights to information included in the composition of information systems are determined by agreement between the information owners and the owners of information systems
- Dissemination and (or) provision of publicly available information shall be carried out free of charge, unless otherwise established by legislative acts of the Republic of Belarus
- The owner of information in relation to the information that he possesses has the right to: demand to indicate himself as a source of information that has become publicly available upon his decision, when it is disseminated and (or) provided by other persons
- The rights of the owner of the information contained in the information resource are subject to protection regardless of copyright and other rights to the information resource
- The rights to information included in the composition of information systems are determined by agreement between the information owners and the owners of information systems

[36] Source: http://rad.org.by/articles/radiation/radiacionnaya-obstanovka-v-evrope.html

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2.3 Progress so far

2.3.1 Main initiatives

State Program for the Development of the Digital Economy and the Information Society for 2016–2020

On March 23, 2016, a new Resolution of the Council of Ministers was made "On approval of the State Program for the Development of the Digital Economy and the Information Society for 2016–2020". As a result, the State Program for the Development of the Digital Economy and the Information Society for 2016–2020 was developed in accordance with the Strategy for the Development of Informatisation in the Republic of Belarus for 2016–2022. The program includes the following areas:

- Information and communication infrastructure
- Information Infrastructure
- Digital Transformation

As such, developed state information systems are subject to mandatory integration with the nationwide automated information system in order to provide electronic services. Interdepartmental interaction in the operation of state information systems will be carried out using the infrastructure of interdepartmental information systems, the list of which is given in the appendix to the Decree of the President of the Republic of Belarus of November 8, 2011 No. 515 "On some issues of the information society development in the Republic of Belarus"[37].

The goal of the State Program is to improve conditions that facilitate the transformation of human activities under the influence of information and communication technologies, including the formation of a digital economy, the development of an information society and the improvement of e-government.

Development of the Nationwide automated information system (NAIS)[38]

The NAIS is designed to integrate national information resources and automate the activities of government bodies in providing information services to other government bodies, organisations and citizens. At the same time, the objective of NAIS is to improve the efficiency and quality of the functioning of State bodies and, consequently, the quality of the services provided.

Thanks to the establishment of interdepartmental cooperation mechanisms, State bodies are able to carry out their functions faster and more efficiently. For ordinary citizens this means simplicity, convenience and rapidity in satisfying their requests.

From the environmental data perspective, NAIS could be leveraged to improve interoperability of systems.

NAIS is a good example of e-government initiative for other EaP countries which are less developed in the area of e-services and system interoperability.

App "Weather in a pocket"

A test version of Belgidromet's mobile app "WEATHER IN A POCKET" has been published, which provides to user information about the actual weather, hydrological, agrometeorological and radiation-ecological situation in settlements of the Republic of Belarus.

[37] https://portal.gov.by/i/portalgovby/download/ukaz-515.pdf
[38] https://portal.gov.by/

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Open data portal

At present, data provided by the State is dispersed. Work on improving the national open data portal is ongoing. The launch of an open data portal was a milestone for public data availability in Belarus. However, as the amount of datasets is still very low at the moment, and the awareness and use of it by the public or state authorities is limited.

However, in May 2019, a draft version of the law "On the functioning of the national open data portal on the basis of a single electronic services portal" was proposed to the Council of Ministers of the Republic of Belarus, which, when finalised and enforced, will be a considerable advancement in establishing data dissemination in Belarus. The law would legally define the ownership of the portal, the data on the portal, the responsibilities of the owner as well as the publisher, the duties of the state authorities regarding the dissemination of public data among others.

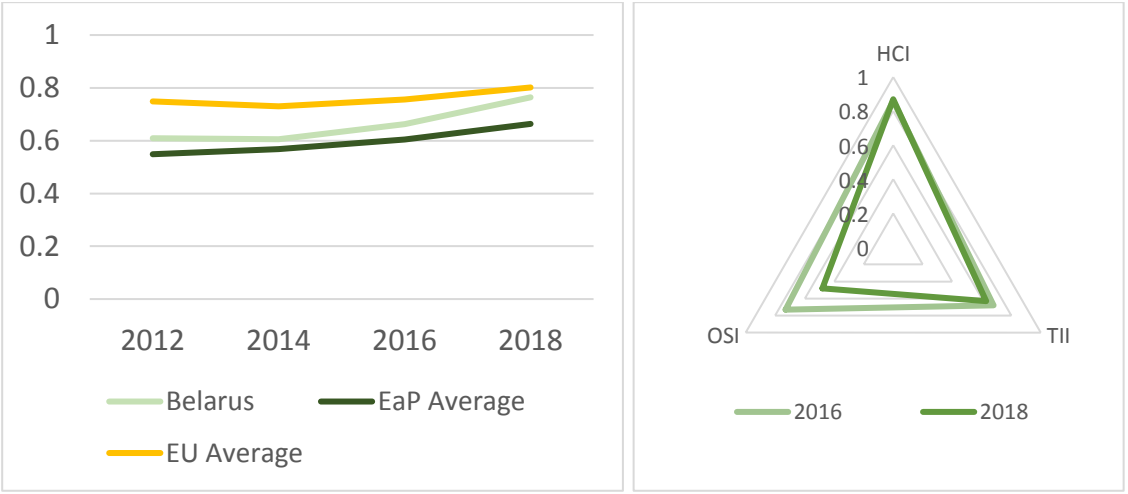
2.3.2 International rankings

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.

In 2018, Belarus scored 0.7641, reaching the position 38th in the world ranking. The average score of EGDI index in 2018, for the whole Europe, was 0.7727, therefore one can see that Belarus is very close to the EU average.

Figure 2. EGDI of Belarus



In 2018 Belarus was a leader among the EP countries in terms of e-government. The country with the second best score in this group, was Georgia (score: 0.6893; rank #60). The worst country in this group, when it comes to the e-government development, was Armenia (score: 0.5944; rank #87).

The figure above shows the change in value of EGDI components between 2016 and 2018. Online Service Index has increased significantly in the last two years to the level of 0.7361 (51.6% increase). The big improvement for

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the OSI in Belarus is to be attributed to the development of the e-service portal and the Nationwide Automated Information System which connects a series of information resources.

The Human Capital Index on the other hand is stable. The Telecommunication Infrastructure Index has the lowest score out of these 3 categories, but it has been experiencing steady growth in recent years and is currently at the level of 0,6881.[39]

The table below shows the comparison of EGDI components among the EP countries in 2018. Belarus has the highest score when it comes to Human Capital Index (0.8681) and Telecommunication Infrastructure Index (0.6881). Belarus is a leader when it comes to EGDI in the EP countries, but is not the best in all subcategories. When it comes to Online Services Index the Republic of Moldova has managed to achieve a better score than Belarus (0.7708 > 0.7361). One can see that the most important issue for all EP countries is to improve telecommunication infrastructure in the following years and the availability of online services (the value of TII is the lowest in all countries in comparison with the other 2 components – HCI and OSI).

Table 9 Value of EGDI components in EP countries in 2018

Country	HCI	OSI	TII
Armenia	0,7547	0,5625	0,4660
Azerbaijan	0,7369	0,7292	0,5062
Belarus	0,8681	0,7361	0,6881
Georgia	0,8333	0,6944	0,5403
Republic of Moldova	0,7274	0,7708	0,4787
Ukraine	0,8436	0,5694	0,4364

Open data barometer[40]

Belarus is not yet evaluated as part of the latest Open Data Barometer.

The fourth edition of Open Data Barometer[41] was published on May 2017, covering the period between July 2015 and June 2016. This is also the first edition of the report where the data from Belarus are available. Covering 114 countries, the fourth edition of the report ranks governments on:

- Readiness for open data initiatives (27 out of 100 points for Belarus);
- Implementation of open data programs (10 out of 100 points for Belarus);
- Impact that open data is having on business, politics and civil society (2 out of 100 points for Belarus).

These results in individual categories gave Belarus 93th place in Open Data Barometer ranking with a combined score of 10.95 points. It's hard to assess the progress made by Belarus in the context of this ranking since the country appeared in the Open Data Barometer for the first time.

[39] https://publicadministration.un.org/egovkb/en-us/data/country-information/id/16-belarus
[40] More information about the evaluation methodology are available on the Open Data Barometer website.
[41] Sources: https://opendatabarometer.org/4thedition/detailcountry/?_year=2016&indicator=ODB&detail=BLR

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In regard, with environmental information, the Open Data Barometer gives a score of 15 out of 100. The main points for environmental Open Data in Belarus are: unclear licensing, difficulty to find datasets, no metadata standards, lack of machine-readable format, and absence of impact analysis.

Global Open Data Index

Belarus is not evaluated in the Global Open Data Index.

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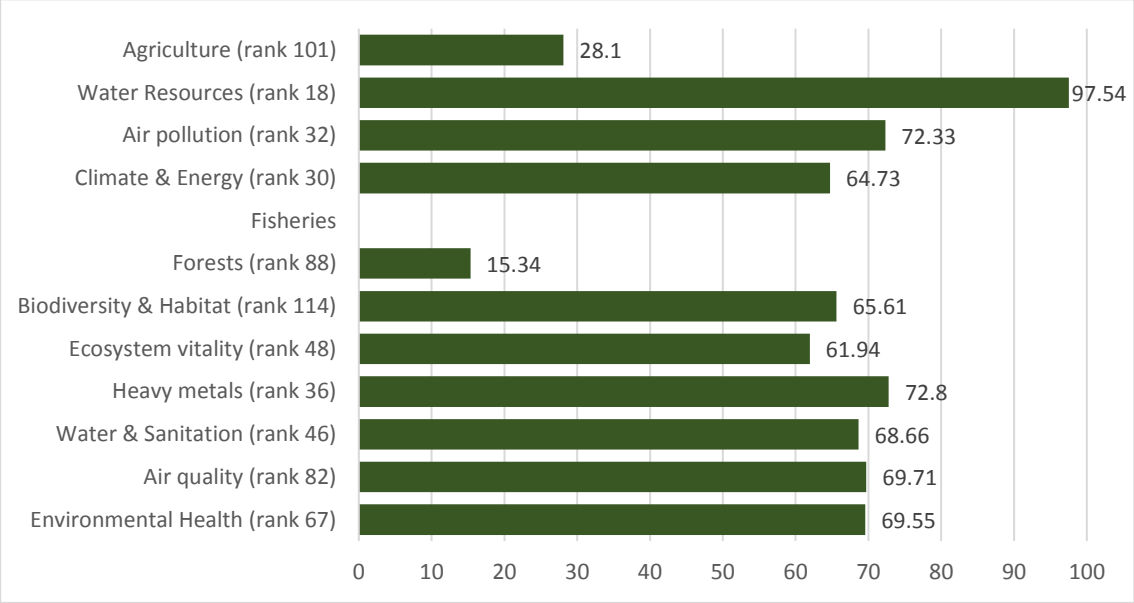
Environmental Performance Index

The Environmental Performance Index (EPI) ranks 180 countries on 24 performance indicators across ten 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, the Republic of Belarus ranked 44 out of 180 countries with the score 64.98. The figure below shows the main indicators of Environmental Performance Index for the Republic of Belarus.[42]

Figure 3. Indicators of EPI of Belarus



ODIN score

The Open Data Inventory (ODIN) assesses data provided by national statistical offices (NSOs) on their principal websites about thematic coverage and openness. The results are tabulated to allow comparisons across different datasets within a country and between countries. ODIN's unique methodology has so far been applied to 180 countries.

In 2017 the Republic of Belarus had 58 points (out of 100) in terms of data coverage and 40 points (out of 100) when it comes to data openness. This translates into combined result of 48 points (out of 100) in ODIN score (#57 in the world)[43].

When it comes to environmental statistics the situation is as follows:

Table 10 - ODIN, details for Belarus between 2015 and 2017

	2015	2016	2017
Coverage	55	62	58
Openness	18	37	40

[42] https://epi.envirocenter.yale.edu/epi-country-report/BLR
[43] Source: http://odin.opendatawatch.com/Report/countryProfile/BLR?appConfigId=4

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All elements	36	49	48

The table shows the comparison of ODIN score in the EP countries in 2017. The main problem of the Republic of Belarus is data openness, which is gradually increasing. The country hits only 40 points out of 100, which place them on the 5th position among the EP countries, right before Ukraine (37 points). When it comes to data coverage the Republic of Belarus has the second position among the EP countries, with 58 points.

Table 11 ODIN score comparison among the EP countries in 2017

Country	Coverage	Openness	Overall	World rank
Armenia	51	56	53	45
Azerbaijan	59	43	51	50
Belarus	58	40	48	57
Georgia	53	57	55	38
Republic of Moldova	54	80	67	14
Ukraine	47	37	42	74

Source: http://odin.opendatawatch.com/

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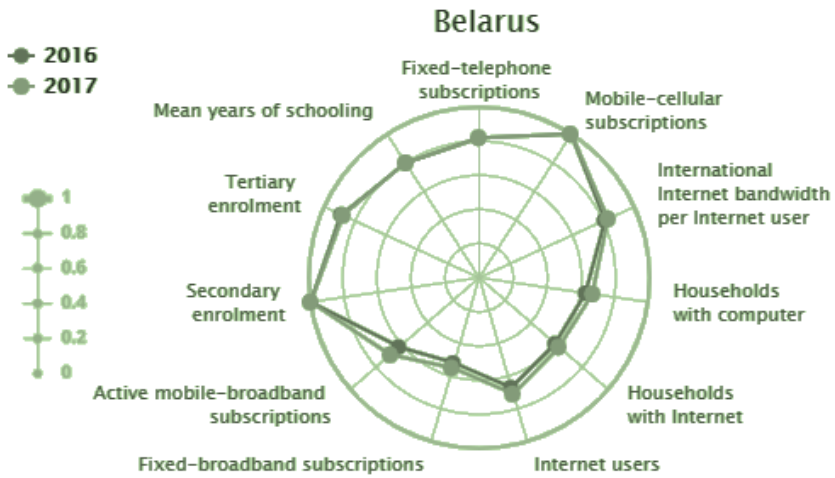
2.3.3 ICT related statistics

The International Telecommunication Union[44] has published the annual report "Measuring Information Society Report", which assesses the development of ICT in the 176 countries. Belarus, as in the previous report of 2016, ranks 32nd and is the leader in the development of ICT in the post-Soviet countries. Belarus is also ahead of a number of European countries - Lithuania, Latvia, Czech Republic, Italy, and Poland.

Figure 4. ITU ICT ranking



In comparison with the previous year, Belarus has managed to make progress on the sub-index of access to ICT (+3 items), the sub index of ICT use (+2 positions), and to maintain its position among the world leaders in terms of human development (5th place). The report notes that due to sophisticated and progressive policy in Belarus, a developed infrastructure has been created that makes it possible to provide the population with quality and affordable fixed and mobile broadband Internet access services.

According to the forecasts of the International Telecommunication Union (ITU), the successful implementation of the State program for the development of the digital economy and the information society will help to consolidate and improve the position of Belarus in the ITU rating by further deploying LTE[45] (Long Term Evolution) networks in the country's regions, developing fibre-optic networks, satellite communications, digital television and cloud technologies.

The "Belarus Informatisation Development Strategy 2016-2022" lays down the principle for the ICT strategy. Specifying the priorities of the Informatisation Strategy, the main directions of development of the national information and communication infrastructure over the considered period will be:

- Further development of stationary broadband access taking into account the use of modern access technologies, which will be mainly based on building infrastructure using fibre-optic communication lines (GPON – Gigabit Passive Optical Network), improving the quality and technological parameters of providing fixed-line broadband Internet access services

[44] https://www.itu.int/net4/ITU-D/idi/2017/index.html

[45] In telecommunication, Long-Term Evolution (LTE) is a standard for wireless broadband communication for mobile devices and data terminals, based on the GSM/EDGE and UMTS/HSPA technologies. It increases the capacity and speed using a different radio interface together with core network improvements.

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- Further development of wireless broadband access, with a gradual shift from the transmission of voice traffic to data transmission. The basis for the development of mobile broadband access in the Republic of Belarus will be the existing mobile broadband access (3G) network, as well as the cellular mobile telecommunications network using LTE (4G) technology, the introduction and development of which will ensure the satisfaction of the growing information needs of citizens regardless of their geographical location
- Development of digital television broadcasting using various technologies and methods of delivering a television signal to a consumer: terrestrial (on-air) television broadcasting, cable television, IP television, television broadcasting using Internet technologies with a full transition by 2020 to digital television broadcasting in all networks telecommunications
- Development of cloud technologies that provide, on demand, convenient network access to a common pool of configurable computing resources like servers, storage devices or applications

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3 Technology enablers for environmental information sharing

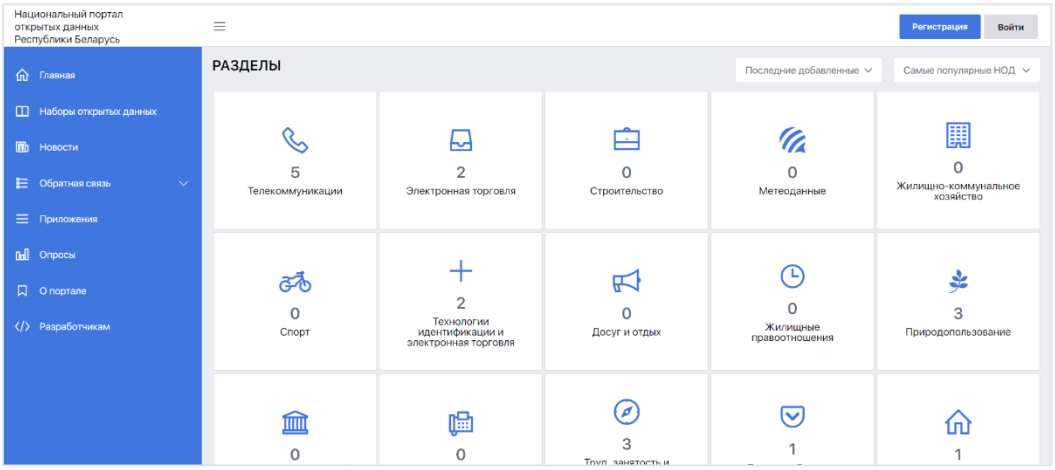
3.1 Portals

In this section, the platforms available for the publication of environmental information at a national and international level are presented.

3.1.1 Open Data portal

The creation of the official Open Data portal is regulated by the resolution of the Council of Ministers of the Republic of Belarus from March 23, 2016 No 235 on the "State program for the development of the digital economy and the information society for 2016-2020". It aims to standardise technical aspects between the private and public agencies, transform the current landscape, where some agencies are more open than others and contribute to efforts to development of a legal framework for information to be released in machine readable format (MRF).

Figure 5. Official Open Data portal https://data.gov.by/



It is important to note that there are two Open Data Portals in Belarus – one official and a non-official one, both providing the public with an easy access to information, free of charge, not restricted by copyright and in MRF. This allows immediate import of data into analytical programs, easier data analysis and comparability.

Everyone may freely copy, publish, distribute, use, including for commercial and monitoring 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.

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Furthermore the main strategy aims at developing Belarus' digital healthcare, education and welfare capabilities. This aims to create a citizen-centric public services flow, easing bureaucratic burdens for citizens and building more effective interactions between people and state. [46]

The non-official Open Data portal has been created by the community of people with the same interests, without a formal structure. It contains information gathered from different state, academic and non-governmental sources.

Currently, the non-official Open Data Portal has around 250 datasets, whereas the official one, announced by the Belarus Communication Ministry and launched in late 2018, has a bit more than 30 datasets. The target is to have at least 60 datasets at the end of end of 2019.

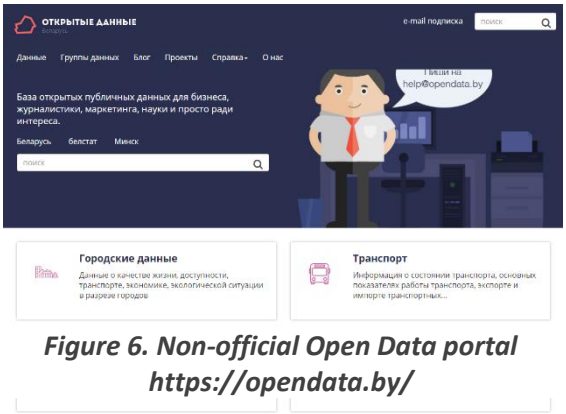

Figure 6. Non-official Open Data portal https://opendata.by/

As in Georgia, the situation of having two Open Data portal might create a "competition for information" and confuse both public institutions and citizens. It is recommended to keep one official Open Data portal and to migrate all possible datasets from the non-official portal to the official portal.

3.1.2 E-government portal

The Republic of Belarus has developed an e-service portal: https://portal.gov.by.

The portal enables searching services by institution, by State Information Resource and by category. At the moment, the portal still has very few services available, and metadata are very poor. As such, it is necessary to further document public services, digitalise public administrations and standardise e-service metadata.

3.1.3 Environmental portals

3.1.3.1 National platforms

In general, analytical and reference materials on the state of the environment are made available on an annual basis on the website of the Main Information and Analytical Centre of the National Environmental Monitoring System (http://nsmos.by/). Information on all types of environmental monitoring in the Republic of Belarus is provided in the annual publication "The National Environmental Monitoring System of the Republic of Belarus: Results of Observations". This publication is developed and is made available on the website of the Main Information and Analytical Centre of the National Environmental Monitoring System in the Republic of Belarus (http://www.nsmos.by/content/402.html). Data on atmospheric air monitoring is used for the preparation of the National State of the Environment Report in the Republic of Belarus (http://www.minpriroda.gov.by/ru/) as well as annual environmental bulletin "The State of the Natural Environment of Belarus" (http://www.minpriroda.gov.by/ru/bulleten).[47]

Environmental information and data are available on the websites of the Ministry of Natural Resources and Environmental Protection, Belstat, the National Environmental Monitoring System, the Republican Centre for Hydrometeorology, Control of Radioactive Pollution and Environmental Monitoring, and other websites.

[46] Resolution of the Council of Ministers of the Republic of Belarus from March 23, 2016 No 235 on the "State program for the development of the digital economy and the information society for 2016-2020"
[47] The Republic of Belarus Country Report, European Environmental Agency, 2012, page 12

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The following main portals are used to publish environmental information:

Table 12. Main environmental information portals

Portal	Description
The official Open Data portal https://data.gov.by/	The official Open Data portal is in its first development stage: the amount of datasets is currently low. The portal is user-friendly but only available in Russian. The portal provides the functionality to request new datasets as well as provide ideas for improvement. Visuals of the statistics of which regions provide the most data as well as what categories the data fall into are provided. No metadata of the datasets can be found and the section dedicated for developers is currently empty. The Portal allows data requests, the ability for the community to contribute ideas.
Non-official Open Data portal https://opendata.by/	The Open Data portal launched by the community provides access to a series of Open Datasets from multiple institutions in Belarus. As is the case with the official Open Data portal, the non-official one is also user-friendly and only available in Russian. Metadata are provided for categorising datasets, tracking changes and publication dates, licences and author. Since the portal is not official, there is no obligation to publish all public information on it.
State Property Committee http://gki.gov.by/en	The State Property Committee has several full-fledged platforms that accumulate a significant amount of reliable geolocated information obtained in a short time, which can be used not only for the purposes of land management and other real estate, forestry and environmental protection, but also for achieving other greens of the Republic of Belarus and the definition of guidelines for planning future activities in the widest range of areas.
Ministry of Natural Resources and Environmental Protection of the Republic of Belarus http://minpriroda.gov.by	The website provides a summary of the key activities of the Ministry and access to few National reports. The website is user-friendly but lacks key information such as the legal framework around environmental information, key data sharing agreements, etc. All information published is in pdf format (non-machine readable).
National Statistical Committee http://www.belstat.gov.by	The portal presents the environment indicators of Belarus under the section “The Shared Environmental Information System Indicator”. The website would require a review of the user interface according to modern standards, but information is clear, available in English and easy to find. The indicators are clearly presented and can be downloaded in machine-readable format (Excel). No licence is mentioned. Belstat compiles information from statistical reporting in Statistical Yearbooks and bulletins. The publication “National Environmental Monitoring System: Results of observations” is produced annually by the Ministry of Natural Resources and Environmental Protection and The National Unitary Enterprise (RUE) Belarusian Research Centre “Ecology”. Since 1991, the Ministry of Natural Resources and

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National platform for reporting indicators of Sustainable Development Goals (SDG's) http://sdgplatform.belstat.gov.by/	Environmental Protection and the Institute for Nature Management[48] of the National Academy of Sciences of Belarus publish annual Environmental Bulletins "State of environment in Belarus" with detailed information on environmental conditions and use of natural resources (water, land and biological resources). The bulletins cover, in a large number of cases, five-year data series. Belstat also launched the National platform for reporting indicators of SDGs portal provides information on the progress done in achieving the 17 Sustainable Development Goals as defined by the OECD. The portal is available in Russian as well as English and amounts to the best practices.
NEMS portal http://www.nsmos.by/	The purpose of this website is to provide the public with reports on various environmental dimensions. Annual reports on land, surface and subterranean water, air, ozone layer, flora, fauna, radiation and the state of ecosystems as well as quarterly reports on air, water and soils are published on the website. No raw data can be downloaded, only data in processed form of reports in pdf format. The portal as well as the reports are available only in Russian.
Specialised website Radiations: http://rad.org.by/ Weather: http://www.pogoda.by/ and http://meteoinfo.by/	The websites provide access to specialised reporting. The user interface is old and would require an update. Information is difficult to find and websites are only available in Russian. There are no licensing norms mentioned.
Geoportal http://gismap.by/	Geoportal of the Republic of Belarus was launched by the Ministry of Communications and Informatisation of the Republic of Belarus in 2014. It provides spatial information, which can be utilised for making informed decisions regarding the environment and management of natural resources, such as land, forests and water. It also provides information on the boundaries of administrative and territorial units and land plots, on land coverage of the territory, reclamation conditions, use restrictions, on engineering communications and much more. It is useful for geodesy, land cadastres, pipeline maintenance and other organisational purposes. Login to the geoportal is carried out by means of authorisation login-password and its use is not free of charge. The portal is available only in Russian.
Cadastres	Environmental information is also available in a number of state cadastres and registers: the cadastre of anthropogenic emissions from sources and absorption by absorbers of greenhouse gases; cadastre of renewable energy sources; climate cadastre; water cadastre; atmospheric air cadastre; cadastre of wildlife; cadastre of subsoils; cadastre of plants; register of specially protected natural areas; cadastre of wastes; register of National Environmental Monitoring System observation points; register of facilities using wastes; register of facilities for storage, disposal and treatment of wastes; unified database of persistent organic pollutants (POPs); and several others. Some are accessible online.

[48] http://ecology.basnet.by/Engl/index.html

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The appendix 1 provides more information about reports, websites, and frequency of publications.

3.1.3.2 International platforms

Shared Environmental Information System (SEIS)

SEIS was established to improve the collection, exchange and use of environmental data and information across Europe and aims to create an integrated, web-enabled, EU-wide environmental information system by simplifying and modernising existing information systems and processes.

More information about Belarus is available at this location: https://eni-seis.eionet.europa.eu/east/countries/belarus.

3.2 Portal maturity for environmental data

3.2.1 Statistics over availability of environmental data online

In Belarus, environmental information and data are published on multiple platforms. They are available on the websites of the Ministry of Natural Resources and Environmental Protection, Belstat, the NEMS, the National Centre for Hydrometeorology, Control of Radioactive Pollution and Environmental Monitoring and other websites.

Open Data portal (official)

As the official Open Data portal has been launched only quite recently, there are currently a bit less than 100 datasets. The portal provides statistics on what data is published on the portal.

In general, filtering data is available only on the basis dataset popularity, the date of publishing or the region of origin. There is no availability to filter out datasets on formats, category or publishing institution. As such, the portal doesn't provide a functionality to search for datasets and hence it will become difficult to find and re-use datasets as the number of datasets published. In that sense,

It is recommended for the Republic of Belarus to first improve its Open Data portal and then to provide legal, organisational and technical mechanisms for the publication of public information on the Open Data portal. In particular, the Open Data portal should be seen as a gateway for developers in the country and as a tool to provide economic opportunities and foster transparency to citizens.

Open Data portal (non-official)

The Open Data portal has now over 250 datasets, and a majority were not updated in 2018. There are no statistics on the portal.

Also, the search of datasets is complicated as there is no possibility to filter search results on such criteria as data format, date of upload, etc. Currently, there are 64 datasets related to environment, which remains little, but better than other EP countries.

In particular, the Open Data Maturity in Europe 2018 report groups countries according to their open data maturity, into Beginners, Followers, Fast Trackers and Trend Setters. Based on the scores and our evaluation, Belarus would most likely belong to the group of "Beginners", characterised as a group of countries that have "shows early stage of maturity on the four dimensions, with more prominent progress on the Open Data policy dimension" but still have limitations in open data availability and use.

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National Statistical Committee of the Republic of Belarus website[49]

Currently, 36 out of 49 UNECE environmental indicators[50] which can provide a practical and economical way to track the state-of-the-environment are available in the National Statistical Committee web page. All datasets are available as xls files for the download.

It is to noted that environmental data can't be visualised dynamically, unlike in Moldova or in Armenia.

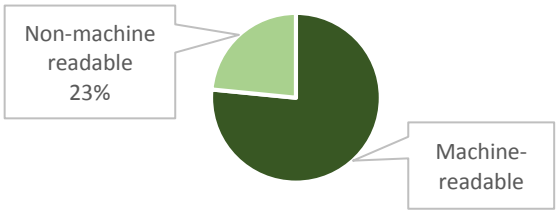
3.2.2 Re-usability of data

Publishing data in machine-readable is essential for enabling re-use of data and maximising its benefits. At the moment, the Republic of Belarus does not have any mechanism in place for obliging institutions to publish data in machine-readable format. Hence, further development of Open Data will require developing such mechanisms.

The official and non-official Open Data portals

However, even without the legal obligations, all of the datasets on the official Open Data portal are provided in machine-readable format, namely, the three formats as follows: xml, json and csv. Every dataset has also an xsd format schema.

Figure 7. Non-official Open Data portal formats statistics



Whereas the non-official Open Data portal provides most datasets in machine-readable format, as shown in the following diagram. Although the number of machine-readable datasets is quite high in comparison with other EP countries, it is necessary to close the gap completely and have fully machine-readable data.

National Statistical Committee

The National Statistical Committee (Belstat) compiles data on the basis of state statistical reporting. It publishes statistical yearbooks, bulletins and the annual statistical edition "Environmental protection in the Republic of Belarus". Belstat also publishes on its webpage a set of core indicators provided to the Shared Environmental Information System (SEIS)[51]. Indicators are all published in machine-readable format (Excel) and in time series. The following picture provides a screenshot of BelStat:

[49] http://www.belstat.gov.by/en/ofitsialnaya-statistika/macroeconomy-and-environment/okruzhayuschaya-sreda/the-shared-environmental-information-system/
[50] https://www.unece.org/index.php?id=30331&L=0
[51] http://www.belstat.gov.by/en/ofitsialnaya-statistika/macroeconomy-and-environment/okruzhayuschaya-sreda/the-shared-environmental-information-system/

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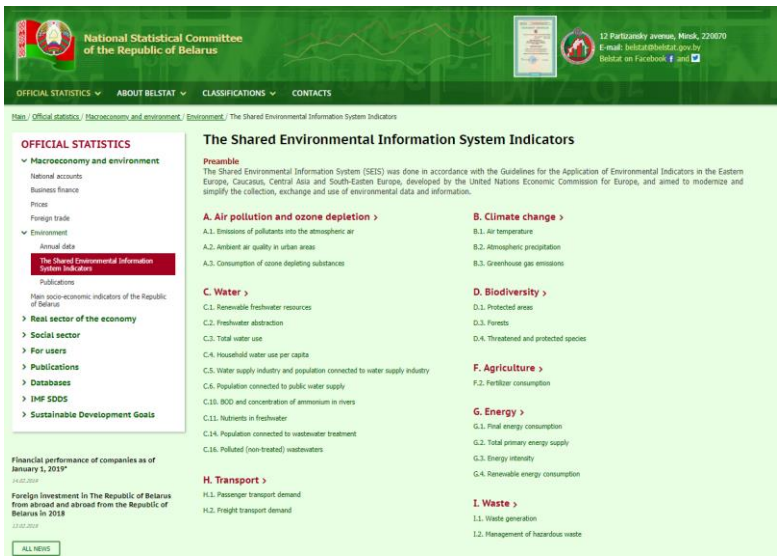
Figure 8. Website and available environmental statistics of the National Statistical Committee (Belstat)



In addition, the English version of the website is different from the Russian one. It is important to ensure full consistency in the translation of the website.

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4 Achieving a high level of maturity for environmental data management

4.1 Main challenges

4.1.1 E-government

The major problems and challenges related to the implementation and maintenance of e-governance initiatives in Belarus are presented in the table below.

Table 4. Major problems related to e-governance

Content	• Number of e-services available: the e-service portal still has very few online services. To solve this issue, it is required to encourage institutions to publish the public services on the portal, and also to promote the platform among citizens. • Lack of metadata standards for the description of e-services: at the moment, the portal doesn't provide extended and complete metadata description for public services. It is therefore required to develop and implement such standard. • Lack of the legal framework regulating the sphere of e-service provision. Despite the fact that a set of important policy documents aimed at introducing e-services has been approved in Belarus for the last several years, a systematic and integrated implementation of such services requires definitions for common rules, standards and formats in the sphere of e-services. • Lack of a government portal containing joint publicly available data & information from various entities. The process of obtaining public information is difficult, as only few entities publish data.
Infrastructure	• Lack of integrated identifiers linking similar information from various State information resources. This problem may cause serious difficulties on establishment of organisational-legal and semantic interoperability of state information resources. • Lack of minimum requirements for interoperability of state information resources: public authorities should plan electronic interaction of their systems with other ones into account by abiding minimum technical requirements.
Cooperation	• Strengthen collaboration between environmental institution and e-government institutions. • Provide organisational mechanisms for the provision of e-services by institutions.

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4.1.2 Open data

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

Table 4. Major problems related to open data

Content	• Lack of extended legal provisions concerning an open data access. The citizens of Belarus have an access to pieces of public information, but further improvements are necessary. There are numerous exemptions and difficulties to receive an information about public sector activities. Information may be released by State agencies upon request, but there is no clear obligation for them to do it. • Few datasets are published on the Open Data portal. There is a need to foster publication of Open Data in institutions so that the publication of public data becomes a "default" process – taking into consideration the legislation of Belarus on restricted data. • Departmental organisation of electronic access to state information resources. Public authorities define their own way of access to information, their lists, number and frequency of publications, which causes differences within a plan to ensure access to information. There are several agencies which are more open than others and yet, their comparatively advanced stance towards open data is not an internal policy but rather private initiative on low and medium organisational level. • Provide multilingual functionality on the portals (this is applicable for all public websites)
Infrastructure	• It is necessary to continue the development and maintenance of the newly established official Open Data Portal. Besides, the country should have only one portal in order to avoid confusion. Hence it will be required to migrate the "community portal" content to the new Open Data Portal. • Develop tools and procedures which enable to "derestrict" public data and hence publish them. • Extend NAIS and/or re-use existing interoperability solutions for the design of environmental monitoring systems. Current exchange of information in the national monitoring environmental system (nmos) is based on Excel files and is not automated. There is no direct interfaces with health, transport, energy, the open data portal, and Belstat. Hence it is required to integrate of environmental monitoring system according to standard APIs and national interoperability standards.
Network	• Strengthen involvement of public institutions in the publication of public information. It is required to involved public institutions more into the Open Data "concept" implementation so that more datasets will be published. Also, it will enable raising core issue such as the need for specific standards, procedures and tools. • Strengthen • the cooperation between e-government, open data, health and environmental institutions for the design of information systems, APIs and interoperability standards.

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4.1.3 Environmental information sharing

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

Table 4. Major problems related to environmental information management

Content	• The amount of portals on which environmental information is too high. It is required to provide a single version of the truth for all environmental data so that citizens and institutions know where to find the latest and official environmental information. • The Belarusian environmental legislation is quite vague and does not set clear code of conduct for all institutions. Part of environmental legislation has been adjusted to meet Aarhus Convention requirements, but the rest remained obsolete and declaratory in nature. According to present rules, public bodies are supposed to gather and manage environmental data, but the way of processing them is not regulated. • Key gaps were identified in Belarus' strategy documents in the area of environment: lack of clear prioritisation among the different environmental goals; low significance of environmental targets in government's development strategy; low level of independence of state environmental agencies; and weak integration of environmental issues into sectoral strategies, programs, and activities. • The State authorities of Belarus and other owners of environmental information decide not to share environmental data and information due to internal reasons. Often, the owner of environmental information refuses to isolate the requested environmental information from documents. Example: the Belarusian Nuclear Power Plant is a vivid example of how the authorities refused to provide information. During the public discussions of the Nuclear Power Plant project, an abbreviated version of the report on the environmental impact on the plant was submitted for discussion. Citizens could see documents only within the building of the Nuclear Power Plant Directorate; they were not allowed to copy the data, and it was also not possible to download the electronic version. • Environmental data provided by Belstat lacks of transparent standardisation. There reference to measurement methods is weak, and their conformity with international standards - and in some cases national categories of protected areas - do not comply with IUCN recommendations[52].
Infrastructure	• The environmental management system underwent significant changes due to Law amendments, however it didn't decentralise the operations; hence the potential of regional offices in terms of environmental information management is not fully exploited. • Modern technologies, such as geographical information systems (GIS), are not fully used. For example, the register of National Environmental Monitoring System observation points was developed using GIS technologies but, since the links to the various databases are not in place, an update of the register is followed by manual actions to the Information and Analytical Centres and Main Information and Analytical Centre databases, and vice versa. Tools, such as forecasting systems on the environmental situation, which could help decision makers, are not developed. The lack of appropriate tools delays the assessment of the health of ecosystems. • Civil servants do not receive reasonable technical training. Substantial investments in ICT systems and related capacity building are required.

[52] State of SEIS implementation in 2018 - Country Factsheet Belarus, European Environmental Agency

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Network

- Despite having a developed system of strategic planning – which goes beyond environmental issues and covers all planning areas – further improvements are needed for the elaboration and adoption of concepts and strategies. As a consequence, strategies are approved at different levels and not all public entities put enough pressure on environmental issues.
- There is no procedure outlining the consultation and coordination mechanism of prepared documents between public institutions. Consequently, the system of environmental management 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. However, the situation may improve with implementation of the Agreement on information interaction between the NSC and the Ministry of Natural Resources and Environmental Protection.
- The outcome of compliance controls is not published. The other stakeholders have limited access to information about monitoring, evaluation and reporting of environmental policies implementation progress. The inspection units are understaffed; they have three to four staff members on average and, quite often, only one to two staff members per district.
- Need for including the public in the design process of services and platforms used by the public community.

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4.2 Roadmap

This section presents key areas[53] of development for the Republic of Belarus. It is to be noted that these initiatives should be undertaken taking into account regional and international collaboration. In particular, 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 is based on the assumption 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 sufficient 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.

It is clear that some of these measures are already in place in the Republic of Belarus (e.g. beginning of a single web-platform for sharing environmental information, interoperability framework/system (NAIS), 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 considered to be under continuous development and hence reviewed periodically.

[53] At this moment, the roadmap does not take into account potential interdependences of measure and timeframe for their execution.

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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: • 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: • 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)

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Measure	Priority	Description
		Adopt an environment data policy: • 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
Timely and regular collection and delivery of environmental data in accordance with the Aarhus Convention, the Protocol on PRTRs (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 PRTRs 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

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Measure	Priority	Description
		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 environmental data to promote its public use and re-use	Low	This action will harmonise all licensing terms and conditions on the different portals used for publishing environmental data. More information about licensing are available in the best practice report.
Carry Open Data impact analysis framework in relation to the environment	Low	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: • 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). More information about the general open data impact assessment can be found in the best practice report.

4.2.2 Infrastructure

Measure	Priority	Description
Establish a single and user-friendly web-access point for environmental information	High	As recommended by the meeting of the parties of the Aarhus Convention, in the annex 6.1, establish a single web access point to environmental information. The design of the web-access will be done through the public consultation on its functionality and design (see decision VI/1 of the Meeting of the Parties to the Aarhus Convention). The single access point can also be designed as an entry points for all policy domains.

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		The portal should have a standard metadata tool and a tool for the verification of the metadata quality.
		
		The portal should act as a public awareness and communication tool for environmental information.
		
		Authorities should also consider which environmental data to publish to the "eco-portal", and:
		
		• 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 :
		  • 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
		
		The design of the web-access point should be done through the public consultation on its functionality and design.
		More information about single access point can be found in the best practices report.

Enhance Interoperability of geospatial, statistical, health and environmental information systems	High	At the moment, different information systems and portals produce, consume and disseminate environment data. This action will: • 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. • Provide mechanisms for consolidating environmental data across time and space These actions can be also addressed within an overarching national interoperability framework. Refer to the best practices for more details about this action.
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 in light of 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 these information. The registry will be used by public

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		servants to support the continuous development of environmental information systems and the dissemination of environmental information. In particular, 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[54], 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	Development of an Integrated Environmental Management System, which will ensure management of data on environmental quality or long-range forecasting. To do so, this action will:
		• Make an inventory of all systems used for management of environmental information
		• Define requirements for an integrated system for environmental information management. In particular, the system will provide functionalities such as:
		  • Workflow (e.g. quality management)
		  • Environmental data collection
		  • Automatic dissemination and update of Open Data regarding the environment
		  • Document management
		  • Integration with external system (statistical, health, Open Data, transport, geospatial, energy, etc. as needed)
		  • Advanced visualisation tools and capability for integration with business intelligence tools
		• Implement the system
		• Train users and institutions on how to use it
		In particular, this action will foresee the development of an efficient system for integrating various types of environmental information at different levels (sub-national, national).

[54] https://www.eionet.europa.eu/gemet/en/concept/4438

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		Note: the system should provide a standard API and a possibility to upload data manually so that compatibility with legacy and external systems can be maintained.
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: • consult environmental information in real time according their location • public could report poaching, mark polluted areas, etc. • public could take part into environmental friendly events in their neighbourhood to fight pollution Integration of environmental data with popular national apps, where possible

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 in order 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.

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Measure	Priority	Description
Develop a framework for measuring the social, political, environmental and economic impact of Open Data	Continuous	This action will 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.
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: • Hackaton • Forums • Promotion campaigns • Develop incubators • Develop public private partnership Develop cooperation between national bodies and NGOs and the academic sector

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Appendix

1 Information resources

Table 13. Information resources on air protection[55]

Resource	Information	Organisation	Period	Update	Website
State cadastre of atmospheric air	Air quality	Belarusian Research Centre "Ecology" http://www.ecoinfo.by/	1990–2014	Annually	
Cadastre of anthropogenic emissions and sources of greenhouse gases	Air polluting emissions and greenhouse gas emissions		1990–2014	Annually, with 2 year delay	www.unfccc.int.by
State cadastre of renewable energy sources	Data on operational RES installations, possible placement areas for installations, as well as on reduction of GHG emissions		2012–2014	Annually	www.minpriroda.gov.by/
State climatic cadastre	Climate	SI "Republican Centre for Hydrometeorology, Radiation Control and Environmental Monitoring" http://hmc.by/	1881–2014	Annually	www.pogoda.by
Database of air pollution observations at the background monitoring station "Berezinsky reserve"	State of atmospheric air		1980–2014	Continuous – hourly; one off – annually	www.rad.org.by
Database "Pavetra"	State of atmospheric air		1996–2014	In Minsk – daily; in other towns – quarterly	www.rad.org.by

[55] Sources: RUE Belarusian Research Centre "Ecology" and SI "Republican Centre for Hydrometeorology, Radiation Control and Environmental Monitoring", 2015.

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Database "ASPavetra"	State of atmospheric air		2007–2014	In Minsk – every 20 minutes; in other towns – hourly	www.rad.org.by
Database "Apadki"	Chemical composition of atmospheric precipitation and snow cover		2001–2014	Information on precipitation pH – weekly; on chemical composition – annually	www.rad.org.by
Database of radioactive contamination of the bottom layer of the atmosphere at the observation points of the monitoring of radiation in air of the Republic of Belarus	Data on measurements of radioactive fallout and concentrations of radioactive aerosols including 137Cs, 90Sr, 131I, 7Be		2001–2014	Daily	

Table 14 .Brief information on the main information resources held by the Ministry of the Environment and Natural Resources and its subordinated entities

Resource	Additional characteristics of the information resource	Organisation that keeps the state information resource	Time interval, updated
1. The state cadastre of atmospheric air	-	RUE "Bel RC "Ecology" (http://www.ecoinfo.by/)	1990-2014, annually[56]
2. The state climatic cadastre	-	SI "Republican Hydrometeorological Centre" (http://hmc.by/)	1881-2014 , annually56
3. Cadastre of anthropogenic emissions and sources of greenhouse gases	-	RUE "Bel RC "Ecology" (http://www.ecoinfo.by/)	1990-2014, annually with 2 year dealay[56]

[56] Environmental Performance Reviews, Belarus, Third Review, UNECE, 2016, page 107

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Resource	Additional characteristics of the information resource	Organisation that keeps the state information resource	Time interval, updated
4. Air monitoring database "Pavetra"	Pollution of atmospheric air	SI "Republican Centre of Radiation Control and Environmental Monitoring" (http://rad.org.by/)	1996-2014, In Minsk – daily; In other towns – monthly[56]
5. Air monitoring database "ASPavetra"	State of atmospheric air	SI "Republican Centre of Radiation Control and Environmental Monitoring" (http://rad.org.by/)	2007–2014, In Minsk – every 20 minutes; In other towns – hourly[56]
6. Database "Apadki"	Chemical composition of atmospheric precipitation and snow cover	SI "Republican Centre of Radiation Control and Environmental Monitoring" (http://rad.org.by/)	2001-2014, Information on precipitation pH – weekly; On chemical composition – annually[44]
7. Database "Radiation monitoring of atmospheric air"	-	SI "Republican Centre of Radiation Control and Environmental Monitoring" (http://rad.org.by/)	2001-2010, monthly
8. Database "Monitoring of atmospheric air at the station "Berezinskiy Zapovednik"	-	SI "Republican Centre of Radiation Control and Environmental Monitoring" (http://rad.org.by/)	1998-2010, monthly
9. The state water cadastre, generalized data on water resources	-	RUE "Central Scientific Research Institute of Integrated Use of Water Resources" (http://www.cricuwr.by/)	2000-2010 , annually
10. The state water cadastre, data on the regime and resources of surface waters	-	SI "Republican Hydrometeorological Centre" (http://hmc.by/)	1990-2010, annually
11. The state water cadastre, ground waters of the Republic of Belarus	-	RUE "Belarusian Research Geological Exploration Institution" (http://geology.org.by/)	2000-2010, annually

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Resource	Additional characteristics of the information resource	Organisation that keeps the state information resource	Time interval, updated
12. The state water cadastre, statistical reports of water users	Use of water	RUE "Central Scientific Research Institute of Integrated Use of Water Resources" (http://www.cricuwr.by/)	1990-2010, annually
13. The state water cadastre – permit for special water use	-	RUE "Central Scientific Research Institute of Integrated Use of Water Resources" (http://www.cricuwr.by/)	2003-2010, on the ongoing basis (when new data is available)
14. Database "Monitoring of surface waters according to hydrochemical indicators"	-	SI "Republican Centre of Radiation Control and Environmental Monitoring" (http://rad.org.by/)	1986-2010, monthly
15. Database "Monitoring of surface waters according to hydrobiological indicators"	-	SI "Republican Centre of Radiation Control and Environmental Monitoring" (http://rad.org.by/)	1986-2010, monthly
16. Information database on integrated use and protection of waters of river basins	-	RUE "Central Scientific Research Institute of Integrated Use of Water Resources" (http://www.cricuwr.by/)	1991-2010, on the ongoing basis (when new data is available)
17. «RECONT» data base	Radioactive pollution of soils and surface waters	SI "Republican Centre of Radiation Control and Environmental Monitoring" (http://rad.org.by/)	1986-2010, on the ongoing basis (when new data is available)
18. The state cadastre of waste	-	RUE "Bel RC "Ecology" (http://www.ecoinfo.by/)	2009-2010, annually
19. The register of storage, disposal and neutralization waste sites	-	RUE "Bel RC "Ecology" (http://www.ecoinfo.by/)	2008-2010, monthly
20. The register of waste use facilities	-	RUE "Bel RC "Ecology" (http://www.ecoinfo.by/)	2008-2010, monthly

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Resource	Additional characteristics of the information resource	Organisation that keeps the state information resource	Time interval, updated
21. Database on pesticides that are not suitable for use and land contamination by them	Pesticides that are not suitable for use at warehouses and at the disposal sites	RUE "Bel RC "Ecology" (http://www.ecoinfo.by/)	2005-2010, annually
22. Database "Monitoring of chemical pollution of soils"	-	SI "Republican Centre of Radiation Control and Environmental Monitoring" (http://rad.org.by/)	2002-2010, annually
23. The State cadastre of flora of the Republic of Belarus	-	Ministry of Natural Resources and Environmental Protection (http://minpriroda.by/ru/	2003-2010, on the ongoing basis (when new data is available)
24. The register of botanical collections	-	Ministry of Natural Resources and Environmental Protection (http://minpriroda.by/ru/)	2005-2010, annually
25. The register of specially protected natural areas of the Republic of Belarus	-	Ministry of Natural Resources and Environmental Protection (http://minpriroda.by/ru/)	1998-2010, on the ongoing basis (when new data is available)
26. The state cadastre of forests of the Republic of Belarus	Forests and lands of the forest fund	Forest Management Unitary Enterprise "Belgosles" (http://belgosles.basnet.by/)	2001-2010, annually
27. The state cadastre of fauna of the Republic of Belarus	Game species	RUE "Bel RC "Ecology" (http://www.ecoinfo.by/)	1999-2010, annually
28. Information and research system of rare animal species	-	Ministry of Natural Resources and Environmental Protection (http://minpriroda.by/ru/)	2008-2010, on the ongoing basis (when new data is available)
29. The state register of observation points of the National Environmental Monitoring System of the Republic of Belarus	-	RUE "Bel RC "Ecology" (http://www.ecoinfo.by/)	1995-2010, annually

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Resource	Additional characteristics of the information resource	Organisation that keeps the state information resource	Time interval, updated
30. The state cadastre of subsoil of the Republic of Belarus	Deposits and manifestations of mineral resources	RUE "Belarusian Research Geological Exploration Institution" (http://geology.org.by/)	1934-2010, on the ongoing basis (when new data is available)
31. The state data bank on drilling exploration of the Republic of Belarus	Boreholes	RUE "Belarusian Research Geological Exploration Institution" (http://geology.org.by/)	1958-2010, on the ongoing basis (when new data is available)

Source: The Republic of Belarus Country Report, European Environmental Agency, 2012, page 38-41.

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