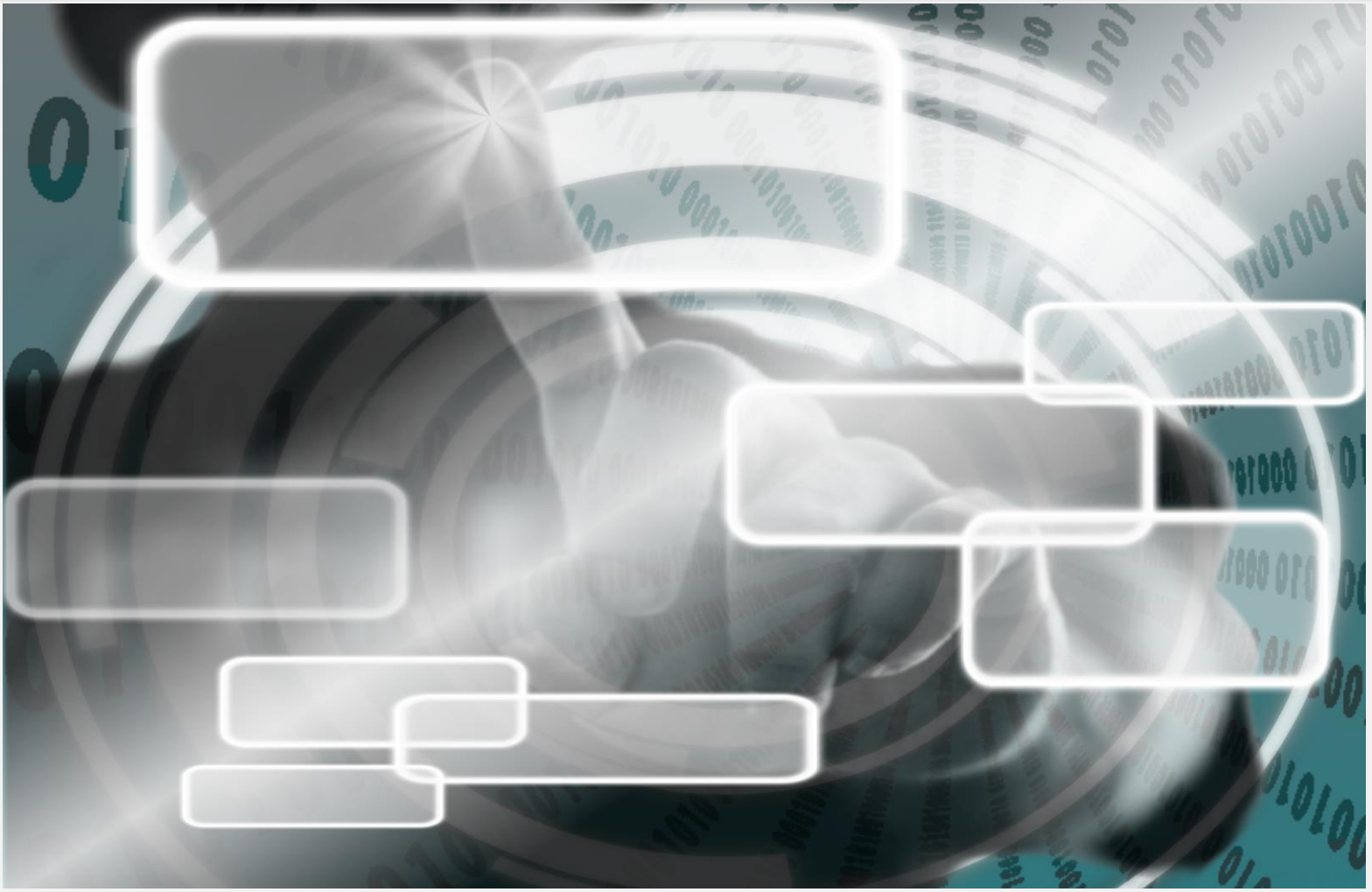
Electronic Registries for Waste across Europe



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European Topic Centre on
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https://www.eionet.europa.eu/etcs/etc-ce

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Summary / Description

EEA and the ETC CE conducted a project that focused on Electronic Registries for Waste as a promising digital tool for waste management assessment. Through a survey of national authorities in Eionet member countries, the project gathered information on the use of these approaches to track waste generation, management, and disposal. This work is intended to support best practice in waste management and the implementation of associated EU legislation.

The survey was completed by 31 of the 38 Eionet member countries, and it was found that 26/31 respondents are currently using an electronic registry for managing waste data. From an EU point of view, it was found that 22/27 of the respondent member states use an electronic registry to manage their waste data. From the survey, it was also determined that most of these systems are quite mature, with 20 countries reporting portals established more than three years ago.

1 Background

Digital platforms are increasingly used to establish electronic registers for monitoring and reporting purposes across many sectors. The EEA and the ETC CE have undertaken this project to examine the use of electronic registries for management and assessment of waste data. The project gathered national-level information on the use of these approaches to track waste generation, management and disposal.

This work is intended to support the implementation of EU waste legislation, in particular, "Directive (EU) 2018/851 of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98/EC on Waste", which states:

> *"4. Member States shall set up an electronic registry or coordinated registries to record the data on hazardous waste referred to in paragraph 1 covering the entire geographical territory of the Member State concerned. Member States may establish such registries for other waste streams, in particular for those waste streams for which targets are set in legislative acts of the Union. Member States shall use the data on waste reported by industrial operators in the European Pollutant Release and Transfer Register set up under Regulation (EC) No 166/2006 of the European Parliament and of the Council (*)."*

On this basis, the project aim was to generate insights into the current status of the use of ERWs for waste management across Eionet member countries. Activity in this area is being progressed at different rates across Europe, and frontrunner countries are well-placed to demonstrate successful approaches and share experiences. The outputs from this work are intended to provide guidance on how to accelerate the implementation of ERW in other countries.

1.1 The Survey

The core task for this project was the conduct of an online survey to gather information on the implementation of ERWs, the experiences of ERW users, and the added-value and challenges for managing authorities. Moreover, the survey looked to identify best practices from European countries with strong, well-developed waste registers. The findings of the survey and the subsequent analysis are included in this report and provide guidance on how to accelerate the implementation of ERWs in other countries.

The work was framed through discussions between the EEA and the ETC, with additional input from European Commission staff to reach a shared understanding of the objective of this study and the methodology to be employed. This phase of the work also included the development of the set of questions to be used to gather details of relevant initiatives in Eionet member countries. The survey was uploaded to the SurveyMonkey platform, and members of the Eionet Thematic Group for Waste Prevention & Management were invited to provide a response. Details of the countries that provided a response to this survey are provided in Annex 1.

1.2 Selection of case studies

The survey work was complimented by three case studies from Eionet members with strong, well-developed waste registries. The three case studies are intended to highlight successful approaches and also to indicate how key challenges were overcome. The three countries involved: Austria, Estonia and Greece, provide insights from different regional positions and population levels.

Box 1: Characterising a 'strong' EWR

The scope of this project was to explore the different approaches taken by European countries in respect to using digital platforms for tracking waste generation, management and disposal. EU legislation articulates features that serve to define good practice for the establishment of an electronic registry for waste data management. In particular, the following sections of the Waste Framework Directive are informative:

- Article 11a - Rules on the calculation of the attainment of the targets
- Article 17 - Control of hazardous waste
- Article 35 - Record keeping

Based on a review of this legislation, key characteristics for the electronic registry or coordinated registries include:

- Cover the entire geographical territory of the country.
- Follow agreed technical specifications and calculation rules to ensure the reliability and accuracy of the data gathered on recycled waste.
- For hazardous wastes, ensure traceability from origin to final destination and control of the waste, including production, collection and transportation, as well as storage and treatment.
- For hazardous wastes, ensure a record of waste producers, waste treatment establishments, and those establishments which collect or transport hazardous waste on a professional basis, or act as dealers and brokers of hazardous waste.
- For other wastes, ensure a record of: a) the quantity, nature and origin of waste and the quantity of products and materials resulting from preparing for re-use, recycling or other recovery operations; and b) the destination, frequency of collection, mode of transport and treatment method foreseen in respect of the waste (where relevant).
- Use data reported by industrial operators in the European Pollutant Release and Transfer Register (where appropriate).

1.3. The structure of the questionnaire

The online survey was based on a questionnaire designed to gather as much information as possible, without overburdening the respondent. Basic information was requested at the beginning of the questionnaire to direct respondents to different answer options, as shown in Figure 1. The survey itself is provided in Annex 2.

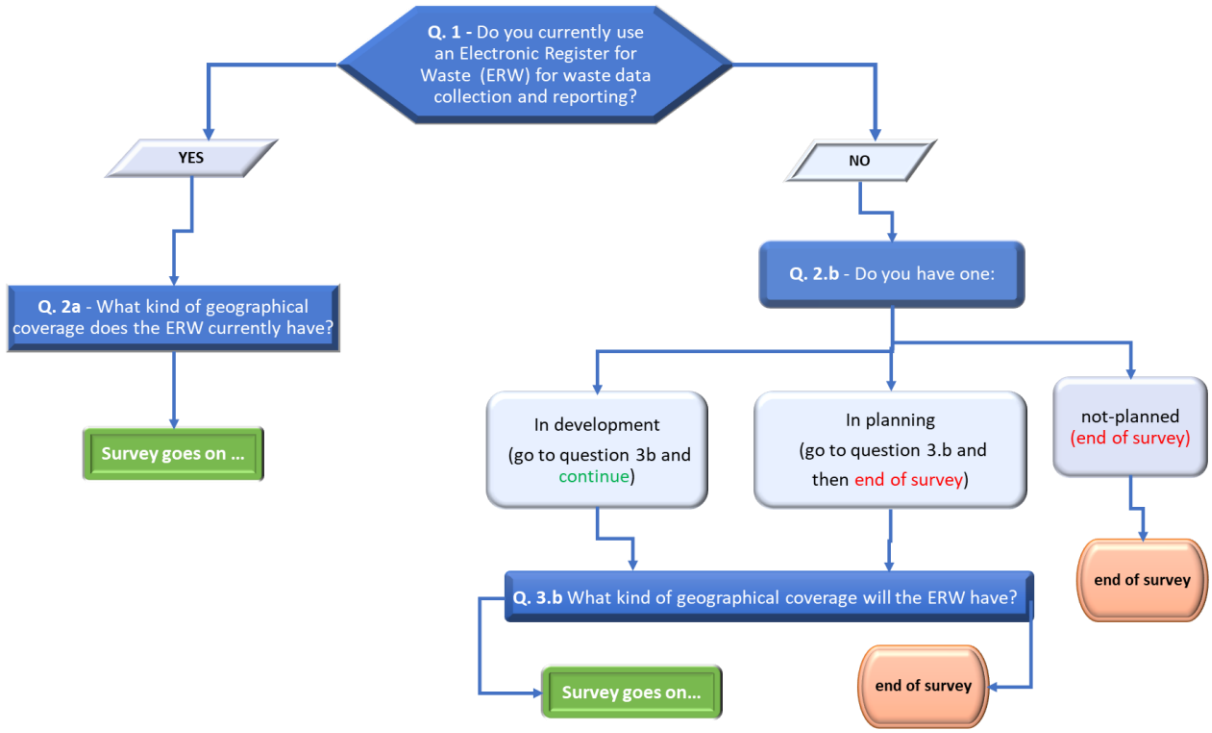


Figure 1: Survey flow of questions.
Source: ISPRA

2. Survey results

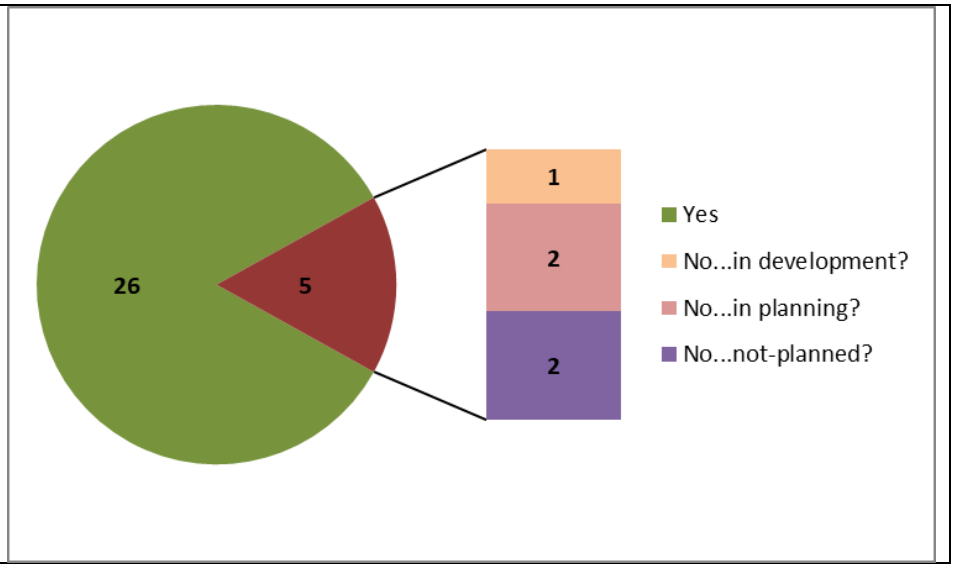
2.1 Response rate

The survey was announced and opened for responses in March 2022, with the closing date set four weeks later. A small number of additional responses were accepted outside the survey period. Of the 38 countries represented in the Eionet network, 31 responded to the survey, of which 24 belong to the European Union. Overall, only 2 countries from the European Union and 5 from the collaborating countries did not respond. The survey can therefore be considered representative of the European situation regarding the electronic register for waste data management. Details of the countries that provided a response to this survey are provided in Annex 1.

2.2 Overview questions

To the opening question, 26 countries answered positively, 5 answered negatively. Of the countries without an ERW in place, one has an ERW in development, two have a system in planning and two stated they are planning to develop one. Some countries have answered with more than one survey, based on the number of registries they have, currently in use or in development. Links to these registries as provided by the respondents are available in Annex 2.

Do you currently use an Electronic Registry for Waste (ERW) for waste data collection & reporting?*	**N° Countries (n = 26)**
Yes	26
No	5
of which….	
in development	1
in planning	2
not planned	2



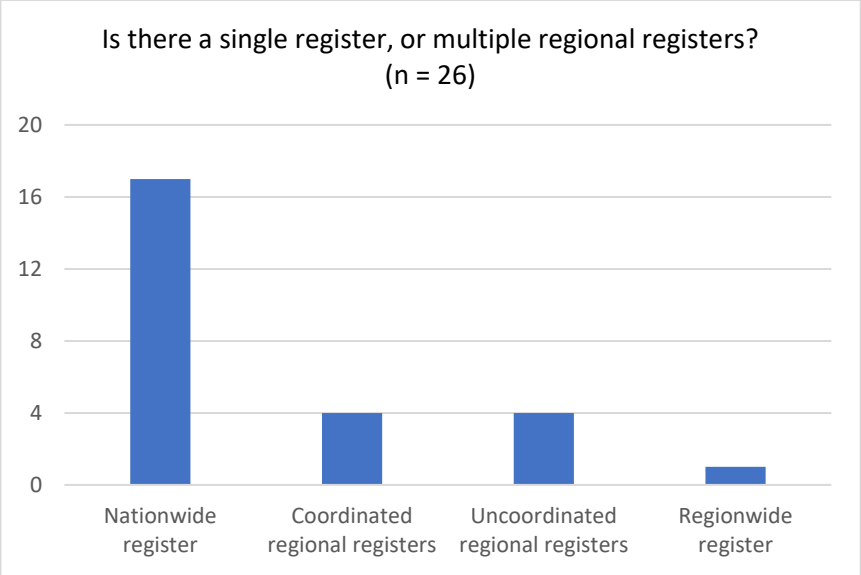
* For the data analysis only one answer was considered, pertaining to the main register currently in use.

2.3 Analysis of data from Countries with an Electronic Registry for Waste (ERW)

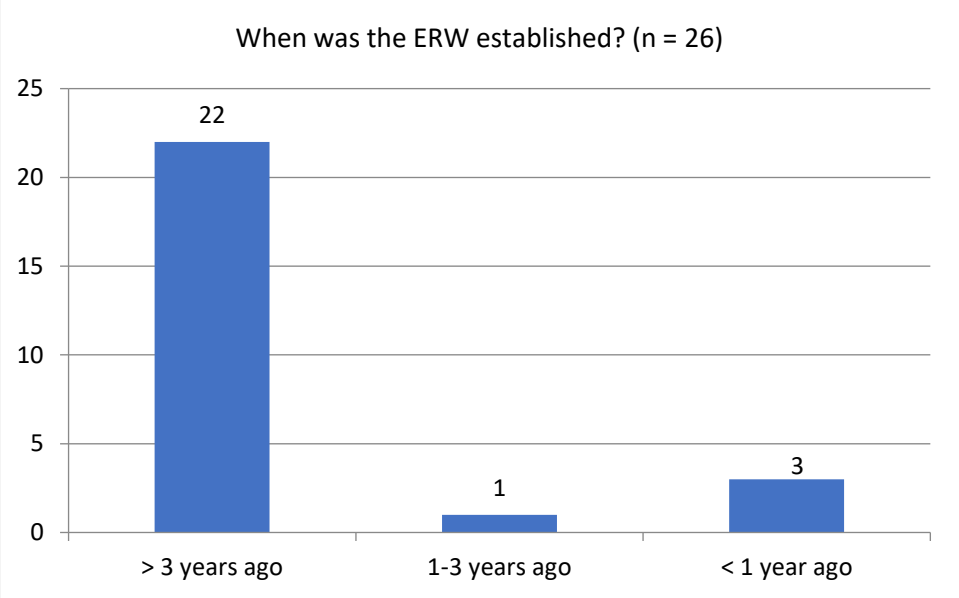
Countries have been asked the geographical coverage of their ERW, and 24 countries answered that they have a nationwide register. Two respondents indicated that the ERW referred only to one administrative region of their country.

What kind of geographical coverage does the ERW currently have?	**N° Countries (n = 26)**
Nationwide	24 (92%)
One region	2 (8%)

The following question was designed to understand the number and nature of the ERWs in operation.



When asked when the ERW was established, most of the countries answered that the ERW was established more than three years ago.



Regarding the answer related to the competent authorities in charge of managing the register, 17 out of 26 countries indicated national public authorities being in charge of managing the ERW.

Who are the competent authorities in charge of managing the ERW?	**N° Countries (n = 26)**
National public authorities (e.g., ministry etc)	17 (65%)
National agency (e.g., environmental agency)	7 (27%)
Regional authorities	1 (4%)
Private contractor	1 (4%)

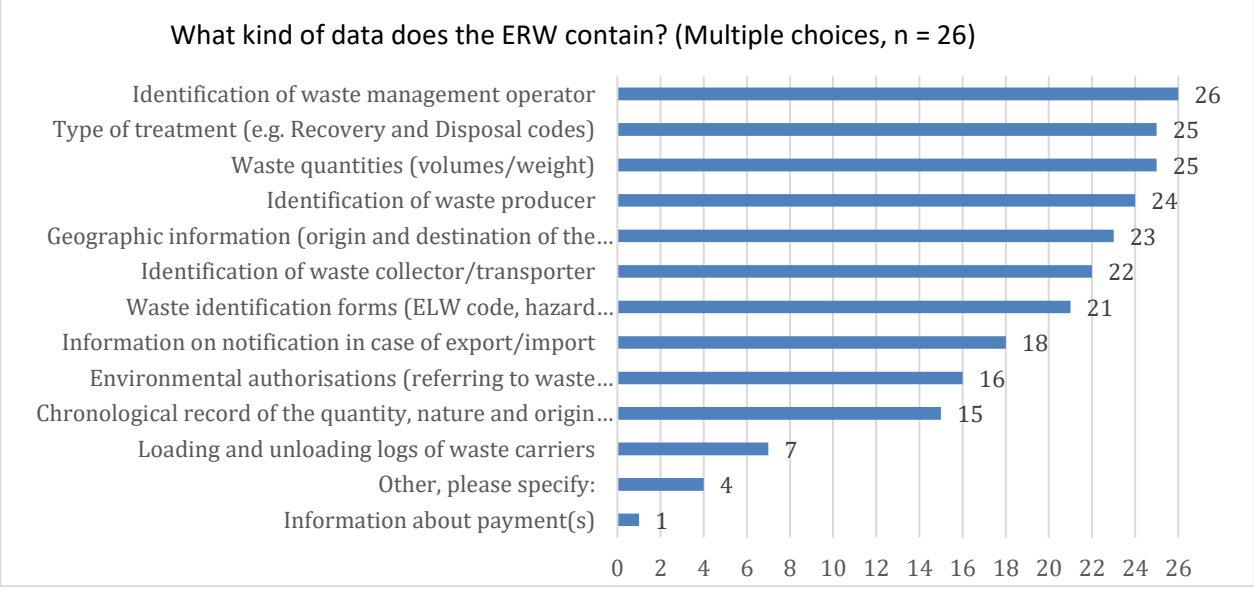
Question related to the traceability of wastes

A series of questions were designed to understand which kind of data are registered and how the traceability of wastes is ensured. The majority of the countries responded positively to confirm that their system facilitates traceability for hazardous wastes and all other waste codes from the European List of Wastes. When asked to specify other data registered, one country reported that their ERW register also "excavated soils and sediments even if they have not waste status", another reported "waste oils, waste tires, municipal sewage sludge, recycled ships".

Which waste streams are included in the ERW? (Multiple choices)	**N° Countries (n = 26)**
All waste codes from European List of Wastes (LoW)*	21
Hazardous waste	20
Municipal waste	19
Industrial waste	18
Packaging waste	18
Waste electrical and electronic equipment (WEEE)	17
Construction and demolition waste	17
Batteries	17
Food waste	14
End-of-life vehicles	14
Other	2

* One country reported "All waste codes from European List of Wastes (LoW)*" related to "Municipal waste"

When asked what kind of data the ERW contain, all 26 countries responded positively for the "Identification of waste management operator", only one country "information about payments" (a second one reported in the comments about information on municipal payments).



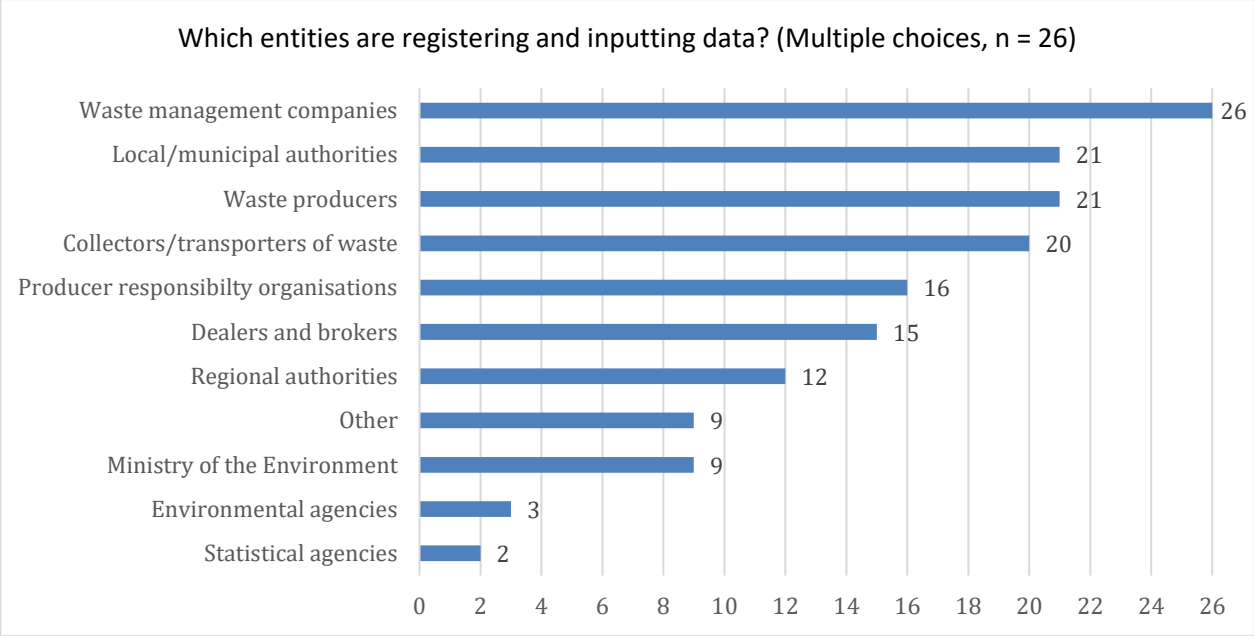
When asked to specify other information registered, countries reported "secondary raw material produced by recycling operation and information about municipal waste payment", also "mode of transport, collection method, transport documents (location data…,)" or "chemical analyses when they are available. Identification of dealers and brokers", "frequency of collection, mode of collection containers (municipal level only)", "producers of hazardous wastes; brokers; waste managers; waste treatment plants; professional waste transporters; producers of non-hazardous waste when they generate >1000 t/year and logistic platforms for waste collection in relation to reverse logistics".

Countries were asked if the ERW register each step from waste generation to its final treatment, and 18 out of 26 responded affirmatively.

Does the ERW register each step from waste generation to its final treatment (waste generated, sorted, pre-treatment, treatment) to ensure no double counting of data and full traceability of waste?	**N° Countries (n =26)**
Yes	18 (69%)
No	8 (31%)

If the answer was no, they were invited to specify how double counting of data is prevented and full traceability of waste is achieved (see Annex 3 for complete version of the responses).

One question was designed to understand who is allowed to input data in the register. All respondents indicated that data are inputted by waste management companies, with other entities also taking this role in some cases.



Countries were also invited to describe any exemptions for entities registering and inputting data in the ERW and 12 reported different exemptions that are gathered in Annex 3.

Are the entities required to report data...	**N° Countries (n = 26)**
...by law (periodically)?	20 (77%)
...by law (immediately)?	6 (23%)

How often are data submitted / recorded?	**N° Countries (n = 26)**
Annually	12 (46%)
Monthly	2 (8%)
Other, please specify:	12 (46%)

Some countries have reported different timing for waste reporting, e.g., depending on the waste type, some have a daily or monthly basis for hazardous waste, some weekly for non-hazardous waste, or monthly for municipal waste.

Is the ERW currently the primary method for reporting on waste to national statistics on waste management?	**N° Countries (n = 26)**
Yes	19 (73%)
No	7 (27%)

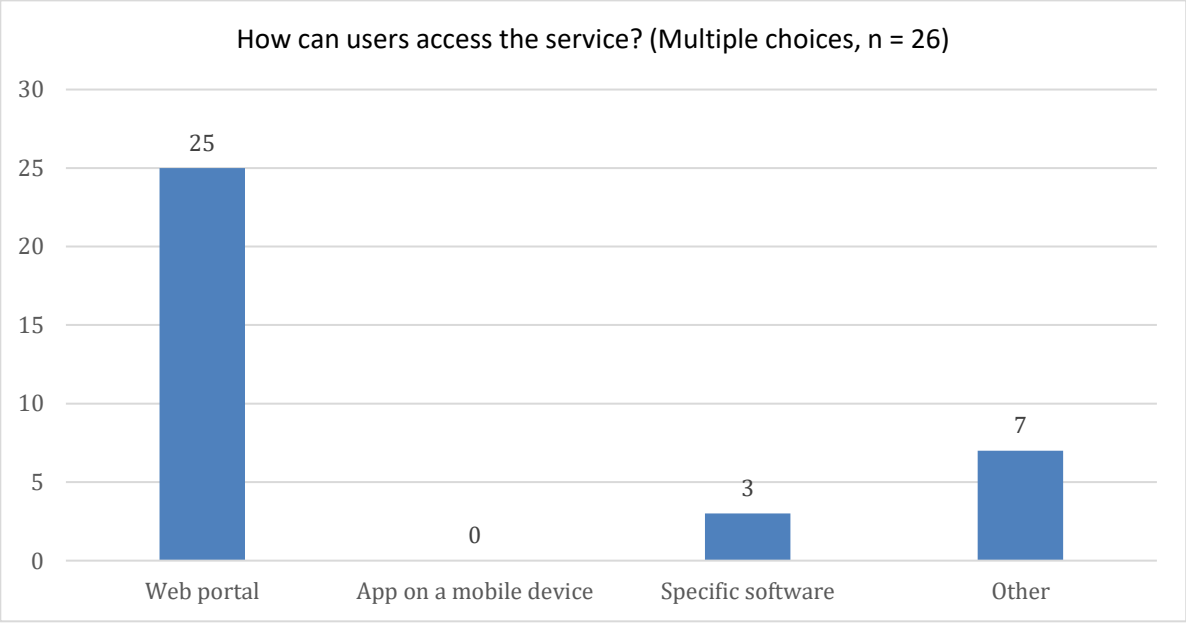
Even if the ERW in place is the primary method for reporting, for 19 out of 26 countries, some countries report specific surveys as an alternative method of reporting or, if the ERW is the primary method for reporting on waste, have other specific collection of data in place for reporting obligations in the framework of specific Directives.

When asked which users can access the data submitted (e.g., competent authorities for inspection, licensing, regional authorities, etc.), basically all countries have stated to keep a restricted access for data (especially data with sensible information). However, some countries have reported to disseminate data with waste reports or through aggregated data in specific websites.

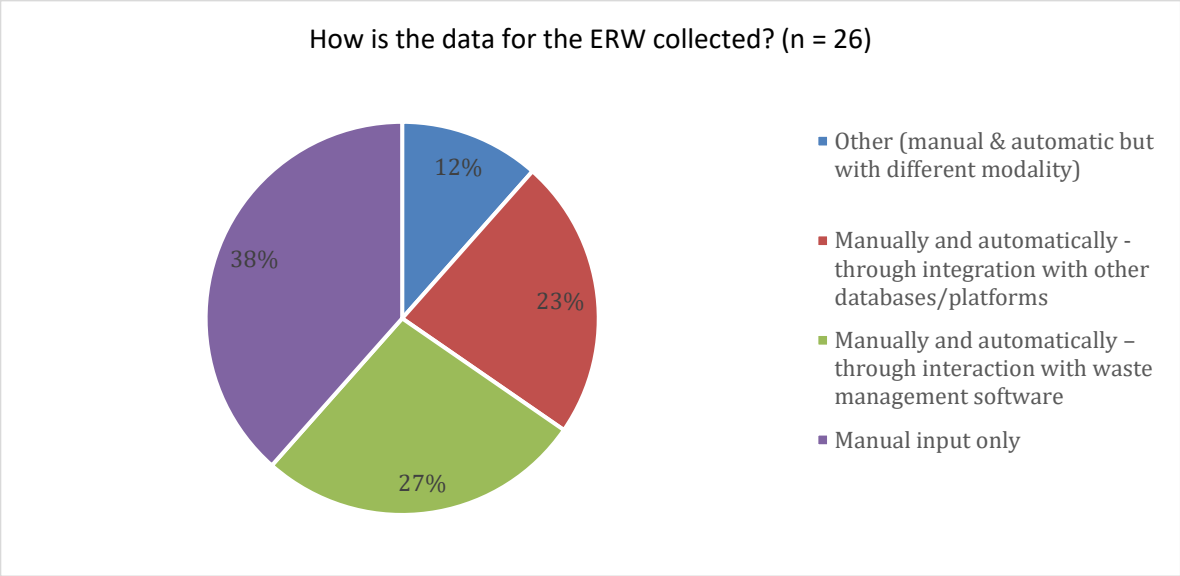
Is/are the registry/registers integrated/connected with other databases or systems (e.g., permitting)? (If yes, please describe)	**N° Countries (n = 25)**
No	10 (40%)
Yes	15 (60%)

Most of the countries reported their ERW connected to other databases, but still 40% of them are not. Popular interconnections are with other 'permit and license systems' or with registries for transboundary movements of waste.

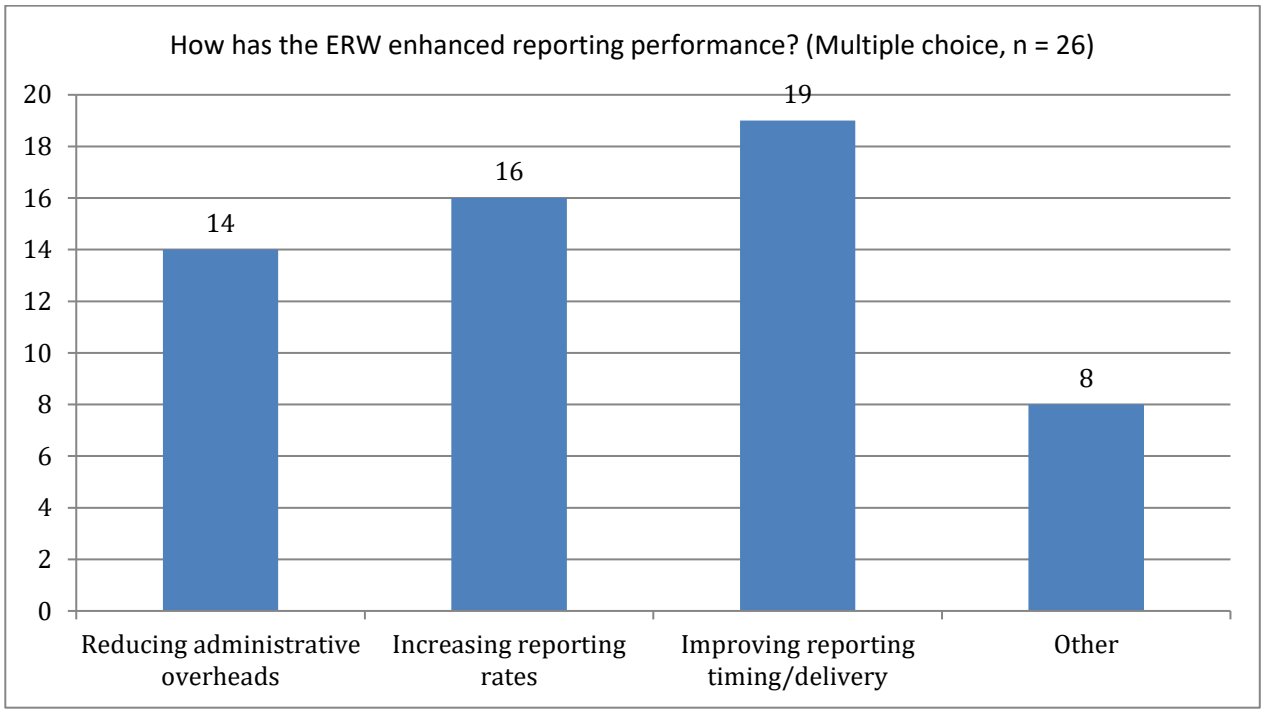
Most of the answers to the question about the accessibility of data to users, report the possibility of accessing through a web portal.



How countries have set up data uploading varies, but manual input is still a widely used methodology.



The main improvements seen by countries in having an ERW have been in reporting timing and rates. However, improvements in data quality, increased control over data provision and an increase in the number of reporters due to increased awareness of companies have also been reported.



Verification and analysis of the data in the ERWs

A little more than half of the respondent countries have an automatic verification of the data by the ERW system, but most of the systems do not allow real-time analysis, for example the calculation and trends and performances. Manual verification has been reported by 9 respondents, usually with a periodicity of once a year or as often as possible. Some system performs partial verification of data and a manual check is carried out following the automatic ones. Some ERW perform some typologies of verifications but manual verification and analyses are still very important for reporting purposes.

Does the system perform automatic verification of the data inserted?	**N° Countries (n = 26)**
Yes	15 (58%)
No	11 (42%)

Does the ERW allow for real-time analysis (e.g., calculating trends or performance towards targets)?	**N° Countries (n = 24)**
Yes	9 (38%)
No	15 (63%)

Challenges encountered

Reporters were asked what challenges were encountered in the development of their ERW. 23 countries have reported possible challenges encountered and all the complete answers can be found in Annex 2. The table below provides a synthesis of the main categories of challenges reported.

What challenges were encountered in the development and introduction of the ERW?	**Mentions in comments**
Data quality assurance and timely collection	8
Time and resources to develop and maintain the ERW	5
Coordination with other national authorities and mandatory nature of the system	4
Identification and tracking origin of wastes with 19 XX XX LoW codes	3
Alignment or integration of previous different databases	3
Adjust the system to both small and large enterprises	1
Updating of information in the ERW and lack of web services for uploading data in some Regional Administrations.	1
Lack of clarity around legal provisions to share waste data	1
Frequency of reporting: annual reporting may not be sufficient, with the demand for more timely waste indicators.	1

The main problems mentioned refer to ensuring a high-quality of submitted data and also achieving a timely response reporting bodies. Respondents also highlighted challenges with ensuring the time and resources needed to manage a ERW to a high standard and keep it updated as legislation develops.
In addition, other major concerns include elimination of duplications, data cleaning, and prevention of data entry errors.

Cost and resources were also signalled as ongoing issues, along with availability of IT personnel, budget, competing IT priorities within organisation. Some issues were addressed by countries through a gradual implementation of the system over time.

The legal obligation to use the reporting system for ensuring full data coverage and coordination between the national authorities on the collection of data were also mentioned as political challenges encountered in the countries.

The alignment and integrations of different waste database already existing in the same country has also been a challenge to address when implementing a single ERW. Another consideration made by the respondents is the difficulty of tracing the origin of waste leaving the plants while knowing the input (based on 19* LoW codes exiting the plant).

Reporters were also asked about the challenges that their users had encountered. All the single answers can be found in Annex 2. The table below provides a synthesis of the main categories of challenges reported.

What challenges have your users reported?	**Mentions in comments**
Enforcing a new tool and switching from paper to electronic format	9
User difficulty in reporting data correctly	7
Challenges related to technical problems	5
Privacy issues	3

The main challenges reported refer to the difficulty of the users to switch from a paper format to a new electronic one. Specially, if they have to continue to report also in paper format or if the various system that they need to use for reporting different obligations are very different. Parts of these difficulties are also due to users who make little use of computers and IT means. Users also mentioned too much workload for reporting when handling many different types of waste from different producers. Since reporting is often time consuming for reporters (when reporting multiple rows of data) some countries are carrying out pilot testing to introduce bulk upload from Excel spreadsheets.

Another frequently mentioned challenge is more related to the complexity of the information requested, needed for European statistical reporting purposes, and the difficulty of the users to properly understand how to apply the rules for waste code identifications and the management operation, with the results that data can be incorrect, or estimated by the users instead of weighted.

How was to be expected, some challenges are related to technical issues that electronic systems can easily presents, as for instance, misfunction of the informatics tools, bugs, problems logging on to the web portal. Some mentions are related to challenges encountered with privacy issues that users have, in relations to the concerns over providing commercially sensitive data and information, for example the identity of end destination facilities in other countries.

3. Case studies

Within the scope of this project, a small cohort of case studies were prepared to complement the survey findings by providing some extra details & reflections from operators of strong registries. These are presented below:

GREECE

ΗΛΕΚΤΡΟΝΙΚΟ ΜΗΤΡΩΟ ΑΠΟΒΛΗΤΩΝ
(ELECTRONIC REGISTRY FOR WASTE)

https://wrm.ypeka.gr

Information provided by:
Hellenic Ministry of Environment and Energy

Overview

Greece uses a single Electronic Registry for Waste (ERW) for waste data collection and reporting that was established in 2016. It has a nationwide geographical coverage and is managed by the Ministry of Environment and Energy.

The ERW includes all waste codes from the European List of Waste and contains the following information:

- Details of waste producer / waste collector/transporter / waste management operator;
- Environmental authorizations (referring to waste plants/managers);
- Geographic information (origin and destination of the waste)
- Information on notification in case of export/import
- Waste identification forms (ELW code, hazard classification, etc.)
- Waste quantities (weight)
- Type of treatment (i.e. recovery and disposal codes)

Operation

The system includes each step from waste generation to its final treatment (sorting, pre-treatment and treatment); and is structured to ensure full waste traceability and avoid double-counting of data.

Data for the ERW can be entered only through manual input annually (by the end of March).

By law (4819/2021), the entities obliged to obtain an environmental permit, a collection and transport of hazardous waste permit or collect and transport non-hazardous waste on a professional basis and municipal authorities have the obligation to report data into the ERW.

Data contained in the registry can be accessed by several organizations including: competent authorities for environmental regulation, regional authorities, the statistical authority, solid waste management organizations and relevant government ministries. The registry is also connected to other public administration systems (i.e. TAXISnet, Diavgeia).

Implementation

The registry is considered to offer an enhanced reporting performance by reducing administrative overheads, increasing reporting rates, and improving reporting timing/delivery. Some challenges

were encountered in the development and introduction of the ERW, such as mistakes correction in waste data input (system based on user input data) and internal control criteria development and application. Moreover, users have reported some issues like data cross-checking between producers, collectors and waste recipients at different stages of waste management.

ESTONIA

KOTKAS Keskkonnaotsuste infosüsteem
(Information system for environmental decisions)

https://kotkas.envir.ee/

Information provided by:
Estonian Environment Agency

Overview

Estonia currently uses an Electronic Registry for Waste (ERW) for waste data collection and reporting that has a nationwide coverage. The Country utilizes a single EWR established more than five years ago. This EWR is a module of the "Information system for environmental decisions". The competent authorities in charge of managing the ERW are the Estonian Environmental Board and Municipalities that have a "Register of waste holders" for own use only. The ERW includes all waste codes from European List of Waste (LoW), as well as some additional subtypes of waste, e.g., for metal waste and for waste of goods related to the producer responsibility (WEEE, batteries and accumulators, vehicles, tires).

The EWR contains data regarding the identification of waste collector, transporter and management operator, data on Environmental authorizations (referring to waste plants/managers), chronological record of the quantities, nature and origin of the waste, geographic information (origin and destination of the waste), waste identification forms (ELW code, etc.), waste quantities (volumes/weight) and the type of treatment (e.g. Recovery and Disposal codes) to which the waste is and/or is foreseen to be subjected. Moreover, only at municipal level, frequency of collection and mode of collection containers are registered.

Operation

The data for is collected manually and automatically through integration with other database/platforms. The system registers each step from waste generation to its final treatment (waste generated, sorted, pre-treatment, treatment) to ensure no doubling of data and full traceability of waste. The system performs automatic verification of the data inserted; however, it does not allow for real-time analysis.

The entities registering and inputting data into the ERW are waste management companies, waste producers, producer responsibility organizations, collectors/transporters of waste, regional, local and municipal authorities. The entities are required to report data by law periodically. Complete data must be submitted once a year, waste disposal data one a quarter (for calculation and payment of pollution tax) and data of transfer and transport of hazardous waste immediately.

The ERW is the primary method for reporting on waste to national statistics on waste management. All individuals and legal entities can access the general information data submitted; profile officials

who are competent for inspections, licensing, law-making regional authorities, including representatives of regional authorities can access the detailed information.

Implementation

The main challenge encountered in the development and introduction of the ERW regards data quality assurance: data submission discipline, awareness, including instructions (digital manuals, video, etc.), supervisory capacity. Some major waste data reporters would like to move to a machine-to-machine data transmission system. There is an active discussion and elaboration of opportunities to move to real-time data collection.

The ERW enhanced reporting performance reducing administrative overheads, increasing reporting rates, improving reporting timing/delivery, increasing control over data provision and improving data quality. An important impetus for the active implementation of the electronic register was the obligation to provide data only digitally.

Austria

Electronic Data Management - Environment

https://secure.umweltbundesamt.at/edm_portal/home.do

Information provided by:
Umweltbundesamt (Environment Agency Austria)

Overview

The "Electronic Data Management - Environment" (EDM) is an e-government system that has been a central strategic area of the BMK (Federal Ministry of Climate Action, Environment, Energy, Mobility, Innovation and Technology) in Austria for years and is legally based primarily on the Austrian Waste Management Act (AWG 2002). EDM (https://edm.gv.at) comprises an interconnected system of Internet applications and databases to support authorities and companies with legally required, environmental protection-related documentation, notification and reporting obligations.

EDM includes, inter alia, waste data collection and reporting. By date, the system contains 22 applications for different reporting obligations, such as site registration and reporting of waste balances. It covers the entire national territory. There are approximately 800.000 individual reporting carried out yearly and about 46.000 users registered. The competent authorities to manage the EDM-System as data controllers are mainly the Federal Ministry of Climate Action, Environment, Energy, Mobility, Innovation, and the Austrian Provincial Governors (Austrian Federal State Authorities). The Environment Agency of Austria is a processor of several parts of the EDM-System respectively contracted to perform the IT system.

In the waste sector, the EDM-System includes data on registered waste producers, collectors, transporters, and management operators, including data on waste treatment facilities and environmental permits. Furthermore, data on type, quantities, origin and destination are reported by companies subject to reporting obligations into the EDM-System in different levels of detail (waste balances, recording excerpts, waste waybills) and partly including the type of treatment (recovery, disposal). The legal procedures related to the transboundary shipment of waste are for

the most part handled with the EDM-System. In the register also legal documents are available (e.g. administrative decisions/permits) and linked to the respective facilities and/or companies.

Operation

For the reporting of waste transfers and treatment, national waste codes are applied in Austria. Some reporting obligations exist in order to track single transfers of waste – from waste generation to its final treatment. Others, like the waste balance reporting, do not allow to track single transfers of waste because the data are reported in an aggregated form (e.g. in case of the waste balance reporting on a yearly basis). Double counting of data is prevented by data evaluation routines which ensure that data sets are accounted for only once.

The entities registering and reporting data to the EDM are mainly waste management companies (waste treatment operators), producer responsibility organizations and collectors/transporters of waste.

Depending on the reporting obligation/or application, there may be various options for the technical processing of reports available. However, the transmission of reports via technical interfaces (via XML) is mainly preferred. This reporting option is particularly relevant for waste balances and for waste waybill reporting: a detailed description of the XML interfaces used is available and published on the EDM-Website. Data is collected (partly manually, partly automatically) by interacting with the waste management software used by the reporting companies. In addition, a portable Windows application is provided for smaller companies/facilities to facilitate data reporting (https://www.eadok.at/).

Implementation

The EDM strengthens administrative processes, facilitates the execution of reporting and improves the quality of reported data. The Austrian system utilizes automatic verification routines and enables routine procedures for analysing the data. To provide an order of magnitude: on a yearly base more than 1.5 million waste transfers are registered for waste balancing.

The Austrian EDM framework facilitates

- efficient registering and data reporting for companies e.g. by registering single facilities once only to fulfil multiple reporting obligations;
- cross-checking reported data with legal obligations via competent authorities.

The standardized and well documented data-interface allows for automatic reporting. The data model is tightly connected to the Austrian (and, thus, European) legal framework and comprises a high level of complexity.

4. Exercise in evaluating of the Electronic Registries for Waste

As an exercise in assessing how close the registers, whose information was acquired through the survey, were to the requirements of the Directive, scores were associated with the answers given. The attempt made, to associate scores with the most relevant questions, in order to assess this proximity, is in no way intended to associate the final score with the quality of the ERWs or their success but is rather a pure exercise.

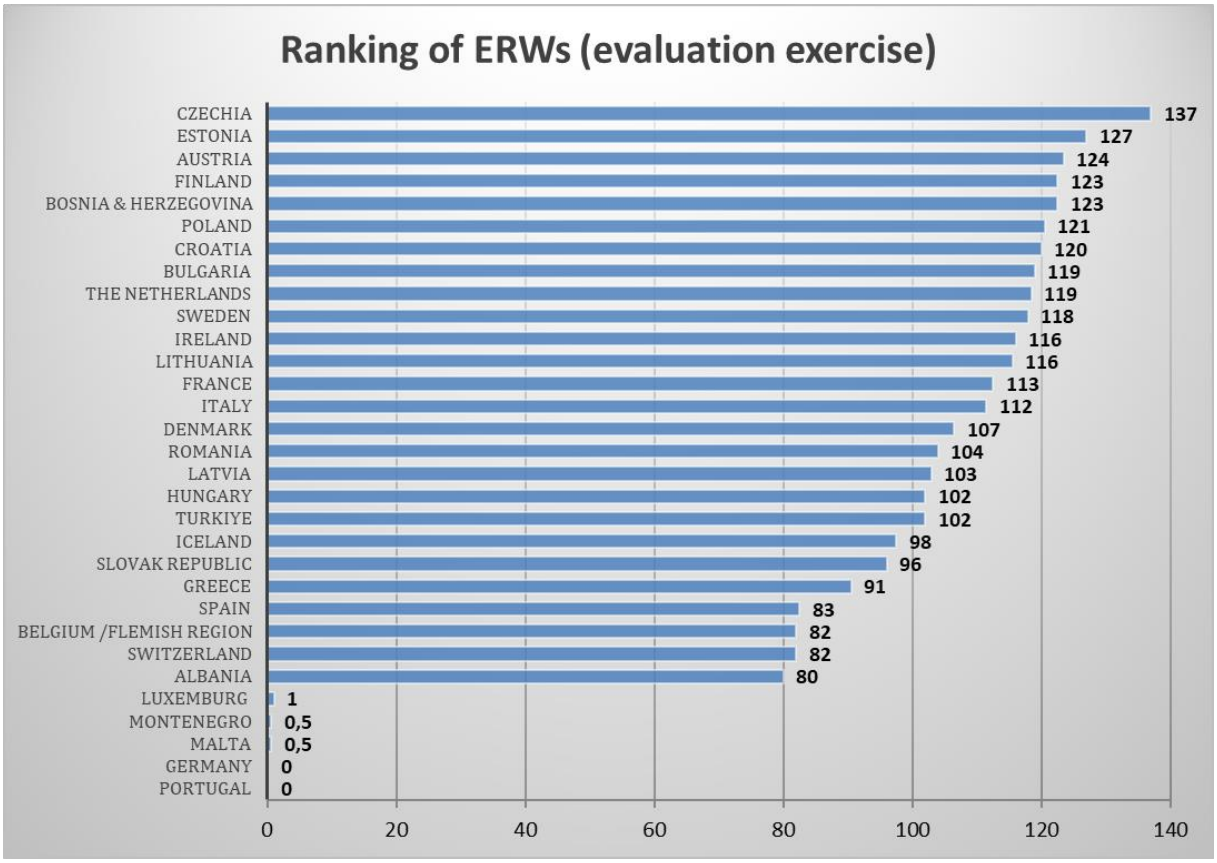
The associated scores vary according to the relevance of the question, but a bonus score was added for any additional relevant information expressed by the respondents. A measure of 10 points were given for positive answer to the principal questions or to question that are supposed to evaluate the degree of digitalisation.

Questions	Points		
Do you currently use an Electronic Registry for Waste (ERW) for waste data collection and reporting?	Yes = 10	No, in development = 1	No, in planning = 0,5
What kind of geographical coverage does the ERW currently have?	Nationwide = 10	Regional = 5	
Is there a single ERW or multiple coordinated/uncoordinated ERWs?	One nationwide register = 10	Several coordinated regional/territorial ERWs = 7	Several uncoordinated regional/territorial ERWs = 5
Does the ERW register each step from waste generation to its final treatment (waste generated, sorted, pre-treatment, treatment) to ensure no doubling of data and full traceability of waste? If not, please specify how doubling of data is prevented and full traceability of waste are otherwise achieved.	Yes = 10	No = 0	
Is the ERW currently the primary method for reporting on waste to national statistics on waste management?	Yes = 10	No = 0	
Is/are the registry/registers integrated/connected with other databases or systems (e.g. permitting)? (If yes, please describe)	Yes = 10	No = 0	
How can users access the service?	Web portal = 10	App on a mobile device = 10	Specific software = 5
How is the data for the ERW collected?	Manual input only = 5	Manually and automatically = 10	
Does the system perform automatic verification of the data inserted?	Yes = 5	No = 0	
Does the ERW allow for real-time analysis (e.g. calculating trends or performance towards targets)?	Yes = 5	No = 0	

More difficult was to associate scores with multiple answer question, so only 1 point was assigned for each answer of the multiple-choice questions except for the question “Which waste streams are included in the ERW?” where very relevant were the two answer “Hazardous waste” and “All waste code from European List of Wastes (LoW)” which were given additional 10 point.

Multiple-choice questions	Points		
Which waste streams are included in the ERW?	Hazardous waste =10	All waste codes =10	1 point to every waste stream included
Which entities are registering and inputting data into the ERW?	1 point to every information included		
What kind of data does the ERW contain? (Multiple choices)	1 point to every information included		

Every question where open ended answer was requested, 1 point each have been assigned, if answered, while if the questions had and open field for specifications (e.g., “Other, please specify: “) and the answer was relevant to the question, a bonus point of 0,5 point was assigned. In annex 4 the exercise of evaluation described with partial scores is available. The figure below shows the final ranking from this analysis.


Ranking of ERWs (evaluation exercise)
CZECHIA 137
ESTONIA 127
AUSTRIA 124
FINLAND 123
BOSNIA & HERZEGOVINA 123
POLAND 121
CROATIA 120
BULGARIA 119
THE NETHERLANDS 119
SWEDEN 118
IRELAND 116
LITHUANIA 116
FRANCE 113
ITALY 112
DENMARK 107
ROMANIA 104
LATVIA 103
HUNGARY 102
TURKIYE 102
ICELAND 98
SLOVAK REPUBLIC 96
GREECE 91
SPAIN 83
BELGIUM /FLEMISH REGION 82
SWITZERLAND 82
ALBANIA 80
LUXEMBURG 1
MONTENEGRO 0,5
MALTA 0,5
GERMANY 0
PORTUGAL 0
0 20 40 60 80 100 120 140

5. Conclusions

The survey was completed by 31 of the 38 Eionet member countries, and it was found that 26/31 respondents are currently using an electronic registry for managing waste data. From an EU point of view, it was found that 22/27 of the respondent member states use an electronic registry to manage their waste data. From the survey, it was also determined that most of these systems are quite mature, with 20 countries reporting portals established more than three years ago.

Respondents indicated that a broad range of waste types are tracked using these registries from hazardous and municipal waste to more specific waste streams, such as food waste, WEEE and End of Life vehicles. For these wate types, most countries reported that the registry was designed to provide full traceability (from generation to treatment), and to avoid double counting of waste volumes.

A wide range of entities were reported to provide data to the registries – including sectoral organisations (including waste management companies, collectors, producer responsibility organisations) and also public bodies (including local & regional authorities, ministries and statistical agencies).

User access is generally via a web portal and manual data entry is still a widely used method of submission. Some systems were reported to also include functionality for automatic uploading from bespoke waste management software or through other compatible databases.

Challenges encountered by system owners were generally associated with difficulties in ensuring on-time submission of data and compliance with data quality requirements. The resources required to maintain and update these systems was also highlighted as an issue. For system users, challenges were mostly linked to the transition from paper-based reporting to an electronic format and related technical difficulties.

Finally, the survey revealed benefits from the introduction of electronic registries which were reported to include reduced administrative overheads; increased reporting rates; and improvements in the timing and delivery of reporting.

Annex 1: Survey respondents, and links to national ERWs

List of Countries responding to the Survey

COUNTRY (Bold: EU countries)	**Response**
Albania	complete
Austria	complete
Belgium	complete (for Flemish region only)
Bosnia & Herzegovina	complete
Bulgaria	complete
Croatia	complete
Cyprus	No answer
Czechia	complete
Denmark	complete
Estonia	complete
Finland	complete
France	complete
Germany	complete
Greece	complete
Hungary	complete
Iceland	complete
Ireland	complete
Italy	complete
Kosovo	No answer
Latvia	complete
Liechtenstein	No answer
Lithuania	complete
Luxembourg	complete
Malta	complete
Montenegro	complete
Netherlands	complete
North Macedonia	No answer
Norway	No answer
Poland	complete
Portugal	complete
Romania	complete
Serbia	No answer
Slovakia	complete
Slovenia	No answer
Spain	complete
Sweden	complete
Switzerland	complete
Turkiye	complete

Links provided by survey respondents to national ERWs

Country	Link to the web portal(s)
Austria	https://secure.umweltbundesamt.at/edm_portal/home.do
Belgium (Flemish region)	https://matis.ovam.be/
Bosnia & Herzegovina	www.otpadfbih.ba Currently, the system can only be used by users who are registered in the system. The development of a module for public access to information is planned.
Bulgaria	https://nwms.eea.government.bg/app/base/home
Croatia	http://roo.azo.hr/index.html
Czechia	https://isoh.mzp.cz/
Denmark	https://www.ads.mst.dk
Estonia	https://kotkas.envir.ee/
Finland	https://sahkoinenasiointi.ahtp.fi/fi/ (not available in English, requires an available permit and username)
France	https://rndts-diffusion.developpement-durable.gouv.fr/fr
Greece	https://wrm.ypeka.gr/
Hungary	https://kapu.okir.hu
Iceland	https://gogn.ust.is/gatt/login.php
Ireland	Information about NWCPO portal available at: www.nwcpo.ie NWCPO portal available at https://portal.nwcpo.ie/Account/Login?ReturnUrl=%2f EPR portal available at https://www.edenireland.ie/ NTFSO: Reporting forms available at: https://wrms.dublincity.ie/wrms/frontoffice/logout.do Registers available at: https://www.dublincity.ie/residential/environment/national-tfs-office/ntfso-waste-shipment-registers;
Italy	Web portal for public access: https://www.catasto-rifiuti.isprambiente.it/
Latvia	http://parissrv.lvgmc.lv/#viewType=reportIndexView&type=3WA&incrementCounter=1
Lithuania	https://www.gpais.eu/en/
Netherlands	https://www.lma.nl/
Poland	Access for entities: https://bdo.mos.gov.pl/ Access for public administration units and inspection authorities: https://jap-bdo.mos.gov.pl/
Romania	https://raportare.anpm.ro/irj/portal/public https://raportare.anpm.ro/irj/portal/login
Slovak Republic	www.isoh.gov.sk
Spain	The link to the web portal can be only accessed for Spanish Public Administrations (Red SARA) https://iportal.miteco.gob.es/portal/site/iportal
Sweden	https://www.naturvardsverket.se/vagledning-och-stod/avfall-farligt-avfall/rapportera-till-avfallsregistret/ https://www.avfallweb.se/Default.aspx www.naturvardsverket.se/verktyg-och-tjanster/e-tjanster/
Switzerland	https://www.veva-online.admin.ch/veva/start.cmd
Turkiye	https://ecbs.cevre.gov.tr/

Annex 2 Questionnaire for Eionet Members

Background

As digital platforms are increasingly used to establish electronic registers for monitoring and reporting purposes across many sectors, the EEA and the European Topic Centre on Circular economy and resource use (ETC CE) are undertaking a project that focuses on Electronic Registries for Waste (ERW) as a promising digital tool for waste management assessment. More specifically, the project will compile national information on the use of these approaches to track waste generation, management and disposal. Activity in this area is being progressed at different rates across Europe, and frontrunner countries are well-placed to demonstrate successful approaches and share experiences.

The survey

On basis of such context, this survey aims at generating initial insights into the current status of the use of ERWs for waste management across European countries. The survey covers background information on the respective ERWs, on the experiences of ERW users, and on the challenges and added value of these electronic registers. Moreover, the survey seeks to support the identification of best practices from European countries with strong, well-developed waste registers. The findings of the survey and further analysis will eventually be communicated in a report to provide guidance on how to accelerate the implementation of ERW in other countries and facilitate the CE.

Please read every question and answer thoroughly before advancing to the next page. In case you filled out something wrong, there is an option for you to move back to the previous page(s). Note that if you want to pause the survey and continue at a later time, you will have to choose the same browser which has to allow for cookies. Depending on individual conditions, this survey can take up to 20 minutes to complete. If you have any questions about the survey, please e-mail us at *jessica.tuscano@isprambiente.it*.

Personal Information (mandatory):

Full Name	
Organisation	
Country	
Email	

	Background		
1	Do you currently use an Electronic Registry for Waste (ERW) for waste data collection and reporting?	Yes (go to question 2a)	
		No (go to question 2b)	
2a	What kind of geographical coverage does the ERW currently have?	Nationwide	
		Some regions	
		One region	
3a	Is there a single ERW or multiple coordinated /uncoordinated ERWs?	One nationwide register	
		Several coordinated regional/territorial ERWs	
		Several uncoordinated regional/territorial ERWs	
4a	When was the ERW established?	< 1 year ago	
		1-3 years ago	
		> 3 years ago	
5a	Who are the competent authorities in charge of managing the ERW? (Please specify if it is a national authority/organisation or several regional authorities and if and how they are coordinated)		
6a	Which waste streams are included in the ERW? (Multiple choices: tick all that apply)	Hazardous waste	
		Municipal waste	
		Industrial waste	
		Waste electrical and electronic equipment (WEEE)	
		Food waste	
		Batteries	
		Packaging waste	
		End-of-life vehicles	
		Construction and demolition waste	
		All waste code from European List of Wastes (LoW)	
		Other:	
7a	What kind of data does the ERW contain? (Multiple choices: tick all that apply)	Identification of waste producer	
		Identification of waste collector/transporter	
		Identification of waste management operator	
		Environmental authorisations (referring to waste plants/managers)	
		Loading and unloading logs of waste carriers	
		Chronological record of the quantity, nature and origin of the waste	
		Geographic information (origin and destination of the waste)	
		Information about payment(s)	
		Information on notification in case of export/import	
		Waste identification forms (ELW code, hazard classification, etc.)	
		Waste quantities (volumes/weight)	
		Type of treatment (e.g., Recovery and Disposal codes) to which the waste is and/or is foreseen to be subjected	
		Other (e.g., frequency of collection, mode of transport):	
8a	Does the ERW register each step from waste generation to its final treatment (waste generated, sorted, pre-treatment, treatment) to ensure no doubling of data and full traceability of waste? If not please specify how doubling of data is prevented and the full traceability of waste is otherwise achieved.	Yes	
		No:	
9a	Which entities are registering and inputting data to the ERW? (Multiple choices: tick all that apply)	Waste management companies	
		Waste producers	
		Dealers and brokers	
		Producer responsibility organisations	
		Collectors/transporters of waste	
		Local/municipal authorities	

		Regional authorities	
		Ministry of the Environment	
		Statistical agencies	
		Other:	
10a	Please describe any exemptions for entities registering and inputting data in the ERW		
11a	Are the entities required to report data:	By law (immediately)	
		By law (periodically)	
		On request	
12a	How often are data submitted/recorded?	Annually	
		Monthly	
		On request	
		Other:	
13a	Is the ERW currently the primary method for reporting on waste to national statistics on waste management?	Yes	
		No (go to 13.1a)	
13.1a	Please explain what other reporting methods are in place:		
User experience			
14a	Which users can access the data submitted (e.g., competent authorities for inspection, licensing, regional authorities, etc.)?		
15a	Are the registry/registers integrated/connected with other databases or systems (e.g., permitting). If yes please describe.	Yes:	
		No	
16a	How can users access the service? (Multiple choices: tick all that apply)	Web portal (go to 16.1a)	
		App on a mobile device	
		Specific software	
		Other:	
16.1a	Could you please provide a link to the web portal?		
17a	How is the data for the ERW collected? (One answer only)	Manual input only	
		Automatically only – through integration with other databases/platforms	
		Automatically only – through interaction with waste management software used by waste producers or operators	
		Manually and automatically - through integration with other databases/platforms	
		Manually and automatically – through interaction with waste management software used by waste producers or operators	
		Other:	
Challenges			
18a	What challenges were encountered in the development and introduction of the ERW?		
19a	What challenges have your users reported?		
Added value			
20a	Has the ERW enhanced reporting performance in the following ways? (Multiple choices: tick all that apply)	Reducing admin. overheads	
		Increasing reporting rates	
		Improving reporting timing/delivery	
		Other:	
21a	Does the system perform automatic verification of the data inserted?	Yes	
		No (go to 21.1a)	
21.1a	Is there a manual verification procedure for data submitted? How often does this take place?		
22a	Does the ERW allow for real-time analysis (e.g., calculating trends or performance towards targets)?	Yes	
		No	
23a	The project aims to build knowledge on the use of digital registries for waste across Europe, through the dissemination of some best-practice examples. Such case studies will then help in providing guidance to accelerate the implementation of ERWs in other countries. Would you be willing to provide a case study for the project?	Yes:	
		No	

	Comments:		

	Background		
2b	Do you have one:	In development (go to question 3b)	
		In planning (go to question 3.b and then end of questionnaire)	
		not-planned (end of questionnaire)	
3b	What kind of geographical coverage will the ERW have?	Nationwide	
		Some regions	
		One region	
4b	Will there be a single ERW or multiple coordinated/uncoordinated ERWs?	One nationwide register	
		Several coordinated regional/territorial ERWs	
		Several uncoordinated regional/territorial ERWs	
5b	When is the ERW planned to be released?	2022	
		2023	
		2024	
		Date to be defined	
6b	Who will be the competent authorities in charge of managing the ERW?		
7b	Which waste streams do you plan to include in the ERW? (Multiple choices: tick all that apply)	Hazardous waste	
		Municipal waste	
		Industrial waste	
		Waste electrical and electronic equipment (WEEE)	
		Food waste	
		Batteries	
		Packaging waste	
		End-of-life vehicles	
		Construction and demolition waste	
		All waste code from European List of Wastes (LoW)	
		Other:	
8b	What kind of data will the ERW contain? (Multiple choices: tick all that apply)	Identification of waste producer	
		Identification of waste collector/transporter	
		Identification of waste management operator	
		Environmental authorisations (referring to waste plants/managers)	
		Loading and unloading logs of waste carriers	
		Chronological record of the quantity, nature and origin of the waste	
		Geographic information (origin and destination of the waste)	
		Information about payment(s)	
		Information on notification in case of export/import	
		Waste identification forms (ELW code, hazard classification, etc.)	
		Waste quantities (volumes/weight)	
		Type of treatment (e.g., Recovery and Disposal codes) to which the waste is and/or is foreseen to be subjected	
		Other (e.g. frequency of collection, mode of transport):	
9b	Which entities are expected to register and input data in the ERW? (Multiple choices: tick all that apply)	Waste management companies	
		Waste producers	
		Dealers and brokers	
		Producer responsibility organisations	
		Collectors/transporters of waste	
		Local/municipal authorities	
		Regional authorities	
		Ministry of the Environment	
		Statistical agencies	
		Other:	
10b	Please describe any exemptions for entities that will register and input data in the ERW		
11b	Will the entities required to report data:	By law (immediate)	

		By law (periodically)	
		On request	
12b	How often will the data be submitted/recorded?	Annually	
		Monthly	
		On request	
		Other:	
13b	Will the ERW be the primary method for reporting on waste?	Yes	
		No (go to 13.1b)	
13.1b	Please explain what other reporting methods will be in place:		
User experience			
14b	Which users will have access to the data submitted (e.g., competent authorities for inspection, licensing, regional competent authorities, etc.).		
15b	Will the registry/registers be integrated/connected with other databases or systems (e.g., permitting). If 'yes', please describe it.	Yes:	
		No	
16b	How will users be able to access the service? (Multiple choices: tick all that apply)	Web portal	
		App on a mobile device	
		Specific software	
		Other:	
17b	How will data for the ERW be collected? (One answer only)	Manual input only	
		Automatically only – through integration with other databases/platforms	
		Automatically only – through interaction with waste management software used by waste producers or operators	
		Manually and automatically – through integration with other databases/platforms	
		Manually and automatically – through interaction with waste management software used by waste producer or operator	
		Other:	
Challenges			
18b	What challenges are being encountered in the development stage and introduction of the ERW?		
19b	What challenges do you expect your users to possibly encounter?		
Added value			
20b	What are the expected benefits of the ERW in terms of enhanced reporting performance? (Multiple choices: tick all that apply)	Reducing admin. overheads	
		Increasing reporting rates	
		Improving reporting timing/delivery	
		Other:	
21b	Will the ERW perform automatic verification of the data inserted?	Yes	
		No (go to 21.1b)	
21.1b	Will there be a manual verification procedure for the data submitted? How often will it take place?		
22b	Will the ERW allow for real-time analysis or monitoring (e.g., calculating trends or performance towards targets)?	Yes	
		No	
Comments:			

Annex 3: Survey responses

Do you currently use an Electronic Registry for Waste (ERW) for waste data collection and reporting?	N° Countries (n=31)
Yes	26
No	5
of which…..	
...in development?	1
...in planning?	2
...not-planned?	2

Is there a single ERW or multiple coordinated/uncoordinated ERWs?	N° Countries (n=26)
One nationwide register	17
Several coordinated regional/territorial ERWs	5
Several uncoordinated regional/territorial ERWs	3
One regionwide register	1

When was the ERW established?	N° Countries (n=26)
> 3 years ago	22
1-3 years ago	1
< 1 year ago	3

Which waste streams are included in the ERW? (Multiple choices)	N° Countries (n=26)
Hazardous waste	20
Municipal waste	19
Industrial waste	18
Waste electrical and electronic equipment (WEEE)	17
Food waste	14
Batteries	17
Packaging waste	18
End-of-life vehicles	14
Construction and demolition waste	17
All waste code from European List of Wastes	21
Other:	2
Excavated soils and sediments are included in the ERW, even if they have not waste status.	1
waste oils, waste tyres, municipal sewage sludge, recycled ships	1

What kind of data does the ERW contain? (Multiple choices)	N° Countries (n=26)
Identification of waste producer	24
Identification of waste collector/transporter	22
Identification of waste management operator	26
Environmental authorisations (referring to waste plants/managers)	16
Loading and unloading logs of waste carriers	7
Chronological record of the quantity, nature and origin of the waste	15
Geographic information (origin and destination of the waste)	23
Information about payment(s)	1
Information on notification in case of export/import	18
Waste identification forms (ELW code, hazard classification, etc.)	21
Waste quantities (volumes/weight)	25
Type of treatment (e.g. Recovery and Disposal codes) to which the waste is and/or is foreseen to be subjected	25
Other (e.g. frequency of collection, mode of transport), please specify:	**4**
mode of transport, collection method, transport documents (location data,..)	
Chimic analysis when they are available. Identification of dealers and brokers	
producers of hazardous wastes; brokers; waste managers; waste treatment plants; professional waste transporters; producers of non-hazardous waste when they generate >1000 t/year and logistic platforms for waste collection in relation to reverse logistics	
Frequency of collection, mode of collection containers (municipal level only).	

Does the ERW register each step from waste generation to its final treatment (waste generated, sorted, pre-treatment, treatment) to ensure no doubling of data and full traceability of waste? If not, please specify how doubling of data is prevented and full traceability of waste are otherwise achieved.	N° Countries (n=26)
Yes	18
No:	8
Doubling of data is prevented by applying the rules of the Basel Convention	
This register only covers treatment facilities and operators, not movements and final destinations of waste.	
The EPA Waste Statistics Team take steps and apply various checks and corrections as part of our validation process to avoid double counting	
partly	
inspection of subjects to verify information	
This has been a problem as only the entity responsible for the final treatment of the waste (or exportation of the waste) registers the waste data to the Agency's waste data portal. They are supposed to register the origin of the waste (both municipality and industry/household) but that information has largely been lost at this point and is no longer reliable.	
Potentially, the same load of waste can be reported several times to the system; this happens, for instance, when the waste collector registers to have collected a load of waste and the reception facility registers to have received the same load of waste from the waste collector. Naturally, this has to be taken into consideration when the primary quantity (net waste generation) is stated. Therefore, all P numbers of the businesses having reported to the system are labelled as "waste actor". The P numbers of businesses stated as waste receivers are also labelled as "waste actors". Waste stated as generated by a "waste actor" is automatically calculated as secondary waste and does not count in the statement of primary waste generated.	
The EPA Waste Statistics Team take steps and apply various checks and corrections as part of our validation process to avoid double counting	
The yearly aggregation of transport/treatment per waste type does not allow a detailed tracing per se. Doubling of data is prevented by data evaluation routines which ensure that data sets are only once accounted for. Concerning traceability: There are mirror-datasets for any waste transfers between waste management operators (each of them must report) which allow by means of calculation routines the tracing of waste streams from waste generation to final treatment.	

Which entities are registering and inputting data into the ERW? (Multiple choices)	N° Countries (n=26)
Waste management companies	26
Waste producers	21
Dealers and brokers	14
Producer responsibility organisations	15
Collectors/transporters of waste	19
Local/municipal authorities	21
Regional authorities	12
Ministry of the Environment	9
Statistical agencies	2
Environmental agencies	3
Other, please specify:	**9**
in the future certification organisms for secondary raw materials	
According to law 4819/2021 the parties that are obliged to register are the companies which have an environmental permit, a permit of collection and transport of hazardous waste, and collect and transport non hazardous waste on a professional basis.	
Companies that place products on national territory (i.e. oils, tires, vehicles, electrical and electronic equipment, batteries or accumulators, packaging, products in packaging).	
People realizing an "end of waste status" operation. Moreover, entities registering data depends on waste status (cf. next answer)	
In the medium term, the register will be made public for all other interested parties.	
All Danish waste collectors, receivers, exporters and importers of waste must report to the system, except for the actors stated in question 14	
EPR-Schemes	

Please describe any exemptions for entities registering and inputting data in the ERW.	N° Countries (n = 16)
at this moment only obliged for municipal waste. scope will be broadened in time	
No straight forward exemptions given. But only the entity responsible for the final treatment or export of waste is required to registering the data to our waste portal.	
No exemptions, under the aforementioned preconditions	
1) producers: a) of municipal waste, b) of waste in the form of end-of-life vehicles, if these vehicles have been transferred to the entrepreneur operating the disassembly station or the entrepreneur operating a vehicle collection point, c) who are farmers who farm less than 75 ha of agricultural land, d) of construction and demolition waste from construction works when producers are natural persons and are not entrepreneurs; 2) natural persons and organizational units who are not a trader, which use waste for their own needs, in accordance with Art. 27(8) of the Waste Act. In addition, the minister responsible for climate, establishes by way of a regulation, the types of waste or the amount of waste for which there is no obligation to keep records, taking into account their harmfulness (regulation of the Minister of Climate of 23 December 2019 on types of waste and quantities of waste for which there is no obligation to keep waste records (Journal of Laws item 2531).	
Exemptions for hazardous waste: Households. Persons giving used oils to authorized collectors. Persons giving end of life vehicles to authorized operators. Persons notificating a transfrontier shipment. Authorized persons to deposit hazardous waste at waste collection sites or to give them to collectors of small quantities of hazardous waste. Scope for non-hazardous waste: ERW's perimeter is restricted to the end of the chain in case of non-hazardous waste. Data are only transmitted in case of landfilling, incineration or in case of "end of waste status" operations. Scope for excavated soils and sediments: ERW's perimeter is larger than in the case of other non-hazardous waste. Data are reported by producers, persons realizing a treatment (including valorisation and elimination operations), a regrouping or a transit.	

01 (wastes resulting from exploration, mining, quarrying, and physical and chemical treatment of minerals) waste codes and 0203 (other municipal wastes) waste code from European List of Wastes are exemptions, waste producers doesn't obliged to notify these waste codes - Within the scope of waste statistics, Turkish Statistical Institute compiles data from manufacturing industry establishments with 50 or more employees, from all active thermal power plants with an installed power of 100 MW or more, from all organized industrial zone directorates having completed their infrastructures, from mining establishments, submitted production data for the reference year to General Directorate of Mining and Petroleum Affairs (Includes mining and quarrying, except crude oil and natural gas extraction. Establishments dealing only with enrichment processes were out of the scope), from all municipalities, from all waste disposal and recovery facilities with temporary or temporary activity certificates and from controlled landfills, incineration and compost facilities operated by or on behalf of municipalities, even though they are not licensed. Entities other than entities mentioned above are not included in the scope of waste statistics. -MoEUCC;01 (wastes resulting from exploration, mining, quarrying, and physical and chemical treatment of minerals) waste codes and 0203 (other municipal wastes) waste code from European List of Wastes are exemptions, waste producers are not obliged to notify these waste codes
1) Recycling stations and collection cubes 2) Companies that receive returned packaging waste that are part of a deposit return system 3) Private return systems 4) A distributor, municipal collection system or municipal collection points that all receive returned batteries or electronic waste 5) Companies that receive waste water via closed sewage systems 6-7) Companies receiving end-of-life vehicles 8) Companies receiving soil to be used for agricultural purposes 9) A company utilizes the leftovers of plant protection products 10) Companies incinerating their own garden waste, park waste or other waste similar to garden waste on their own property 11) Companies compressing waste in a vehicle during transport
Ministry of Defence > no geographical information
Specific obligations were established for entities falling under waste stream related national legislation such as the ordinances on WEEE, packaging, recycled wood, compost, etc.
For domestic waste shipment companies there is no reporting obligation
"3 - Waste" the form is filled in: by operators who have or in the reporting year have a permit to perform category A or B polluting activities or a category C polluting activity certificate for the repair of all categories (L, M, N, O) of motor vehicles, mobile agricultural machinery and non-road mobile machinery and other mobile units and maintenance workshop; - operators who have or have been issued a waste management permit in the reporting year; - waste dealers and waste management intermediaries; 2.3.4. waste management companies who import waste into or leave the territory of Latvia for recovery or incineration, if the incineration is classified as waste recovery referred to in Regulation (EC) No 1774/2002 of the European Parliament and of the Council of 14 June 2006. Article 3 of Regulation (EC) No 1013/2006 on shipments of waste or the Basel Convention of 22 March 1989 on the control of transboundary movements of hazardous wastes and their disposal.
Waste collectors/transporters
Database excludes those not having environmental permit.
- complete data must be submitted once a year (annually). - once a quarter in case of waste disposal, for calculation and payment of pollution tax; - data on the transfer and transport of hazardous waste - immediately.
Currently, the regulation defines the obligation to enter data once a year. A request for change has been made in the sense that minimum quarterly reporting is required. The system is made very flexible to begin with so that it is possible to enter data daily, weekly, monthly, quarterly, etc. depending on the needs of reporting units.

Is the ERW currently the primary method for reporting on waste to national statistics on waste management?	**N° Countries (n=26)**
Yes	19
No	7

Please explain what other reporting methods are in place:	**N° Countries (n = 6)**
Mainly annual surveys (e.g., for municipal waste)	
Different organisations collect waste data	
the regular waste reporting by waste producers. This will be fased out as the scope of the ERW will be broadened. PROBLEM to fase out the reporting by waste producers is the PRTR-regulation. OVAM has the same data from waste collectors, but the PRTR regulation obliges the facilities that transfer waste tot report to the authorities	
ERW is the primary method for reporting on waste, but there are also other methods, especially for collecting data regarding reporting obligations in the framework of specific Directives (such as Landfill directive, directive for the use of sewage sludge in agriculture). In these cases, the obliged parties shall submit to the competent authority answers to specific questionnaires.	
Nowadays, Regional administrations report to the Ministry for Ecological Transition and Demographic Challenge information about production and management waste in their territories. These data came from the chronological record summary of waste management facilities. In the future Ministry wants to develop an electronic Registry for reporting this information.	
National statistics are reported by surveys conducted by TurkStat in the scope of waste statistics.	

Which users can access the data submitted (e.g., competent authorities for inspection, licensing, regional authorities, etc.)?	**N° Countries (n = 25)**
only the department that verifies the reported data from National Environmental Protection Agency and county environmental protection agencies	
restricted access: the general public full access: national and regional competent authorities	
waste authority, inspection. Data in the register is super confidential since the clients of all waste management companies are in the register	
All registered final treatment facilities/entities, either a private company or a municipality or a community association	

Competent authorities for environmental inspection and licensing, regional authorities, statistical authority, Solid Waste Management Organisations, Ministries (Health, Maritime and Island Policy, Rural Development and Food, Infrastructure and Transport) directorates or departments related to environment, industry and waste management.
Access to BDO is guaranteed for: 1) ministers responsible for climate, environment, economy, agriculture, transport, health and inland navigation, 2) General Director for Environmental Protection and regional environmental protection directors, 3) President of the Central Statistical Office and directors of statistical offices, 4) the State Water Holding Polish Waters, 5) the National Fund for Environmental Protection and Water Management and provincial funds for environmental protection and water management, 6) the Main Surveyor of the Country, 7) voivodeship marshals, 8) voivodes, 9) starosts, 10) mayors, presidents of the cities, 11) environmental protection inspection authorities, 12) sanitary inspection bodies, 13) management boards of an inter-municipal association and management boards of an metropolitan association acting in the field of waste management, 14) Police, 15) Road Transport Inspection, 16) mining supervisory authorities, - according to Article 83(1) of the Waste Act.
Competent authorities for inspection, officers working in the data department of the ministry, police officers, officers realizing transport inspection, officers working in the DGPR.
Regional administration, Ministry for Ecological Transition and Demographic Challenge and inspection agencies (SEPRONA from Guardia Civil). In the medium term, the register will be made public and available for consultation by all users.
Ministry of Environment, Urbanization and Climate Change (Units responsible for permit/licensing waste treatment facilities, inspection, etc.) Turkstat
The municipalities (competent authorities for inspection), The Danish EPA, the reporters
regional authorities, environmental inspection, Ministry of the Environment, Czech Environmental Information Agency, Czech Statistical Office (annual data export)
Swedish EPA and other (regional) governmental agencies
EPA system: currently only EPA can access the data. We are examining how to provide access to other public authorities. NWCPO: other public bodies can access the data, through dedicated log-in. NTFSO: a data dump out is provided to EPA for reporting purposes.
Ministry of Environment and Water Executive Environment Agency Regional inspectorate for environment and water
Federal Ministry of Climate Action, Environment, Energy, Mobility, Innovation and Technology; Environment Agency Austria; Environmental Departments of Austrian Federal State Authorities; Regional Authorities (legal documents such as permits are uploaded and available in the EDM system), The public is provided with information of the register, such as a list of companies having collection and treatment permit for specific waste types (register search function)
General information: all individuals and legal entities; Detailed information: profile officials who are competent for inspection, licensing, law-making regional authorities including representatives of regional authorities.
natural persons - entrepreneurs and business entities
-Competent state bodies (Ministries, Environmental protection and Energy Efficiency Fund etc.) -competent regional authorities responsible for data validation (counties); -competent authorities responsible for inspection
competent authorities for inspection, licensing, supervisory bodies, ministries
Competent authorities for inspection, licensing, regional authorities. There is also public access to waste data base
Authorized users of environmental institutions
Representatives of institutions at all administrative levels of Bosnia and Herzegovina: state level institutions; entity for the Federation of BiH through cantonal to municipal. This includes the competent ministries for the environment, statistical institutions, financial institutions that finance the field of environmental protection, inspections, etc. Each institution has access to data in accordance with its competence (legal and territorial).
Supervising authorities, permit-yielding authorities, statistical authorities and environmental research organisations, such as Finnish Environment Institute.
Competent authorities for inspection, licensing, regional authorities, Ministries, Central Bureau of Statistics: All employees of local or national government are allowed to use the data.
National Environment Agency (which includes licensing and inspection authority with regard waste management) has direct access in the electronic register. Data are share within annual publication of the Environmental report and on request
Public administrations including National System of Environmental Protection Agencies , competent authorities for inspection; aggregated data are available in the ISPRA Telematic Catalogue

Is/are the registry/registers integrated/connected with other databases or systems (e.g. permitting)? (If yes, please describe)	**N° Countries (n=26)**
No answer	1
no	10
yes	**15**
Permitting of transboundary movement of waste	
at this moment this is not the case, but in the near future we will do this. Problem is that also in Belgium not all authorities are using the same identifiers for a company and a facility	
interconnection with other public administration systems (TAXISnet, diavgeia)	
The registry will be soon connected to a system enabling emitting and completing following slips for hazardous waste traceability. Later, it will connect to other systems such as the system for waste transfrontier shipments.	
Integrated with Ministry's Electronic Permit and License System	
on regional level	
In the case of EPR schemes registries are used for compliance, other registries are not used for permitting	
Information in EPA and NWCPO systems is linked to permitting/licensing (information is updated as authorisations are reviewed/updated/revoked etc)	
Yes: Currently, a connection to the chamber of commerce is being established for linking commercial activities from a nationwide entrepreneur-register. There are already connections in place to the Austrian statistical office for various reference tables (e.g. postal codes)	
- e-Business Register	
Connection with permits information system.	

Unified Product, Packaging and Waste Record Keeping Information System is integrated with State Register of Waste Managers, which includes from permits.
This system contains a database of waste management permits, environmental permits, etc. and will also be part of the Environmental Protection Information System of the Federation of BiH when it is established.
-Waste transport registries -Finnish Transfrontier Shipments of waste -Producer responsibility database
With a central server where several environmental databases are integrated:

How can users access the service? (Multiple choices)	**N° Countries (n=26)**
Web portal	24
App on a mobile device	0
Specific software	3
Other, please specify:	**7**
API for machine-machine-interactions	
Users can connect their own systems to access the service	
special data sets on demand	
http://roo.azo.hr/index.html (Environmental Pollution Register)*	
SQL-database, api	
on request	
special data sets on demand	
data are in ASCII format, elaborated by ISPRA in MS Access Databases and aggregated for public access	

How is the data for the ERW collected? (One answer only)	**N° Countries (n=26)**
Manual input only	9
Manually and automatically - through integration with other databases/platforms	6
Manually and automatically – through interaction with waste management software used by waste producers or operators	8
Other, please specify:	3
manual input- manual by loading CSV)files - Automatically via API	
Manual filling out of an annual waste report (line by line, one line for each WStatR code) or by manually uploading a csv. file (in excel format) onto the portal. Small treatment facilities most often do a waste report while large waste managers hand in a csv. file. We are looking into also providing an automatic registration through an integration with other databases with an API connection.	
Multiple possibilities exist: There is a detailed description for a XML-interface available. Manually and automatically - through integration with other databases/platforms Manually and automatically – through interaction with waste management software used by waste producers or operators Also, for smaller entities, an application is provided to facilitate data entry reporting (https://www.eadok.at/).	

What challenges were encountered in the development and introduction of the ERW?	**N° Countries (n= 23)**
Reporting through the informatic system is not yet compulsory according to the law	
Mapping of the complex supply chains of waste	
the facility of a waste management company is a black box, since we do not have insight in the internal waste streams between different installations at one site. Example: facility receives separately collected wood, glass, and residual mixed waste. All wastes are sorted. Facility produces wood, glass, metal, plastic, residual waste. It is not possible to assign the outputs to the inputs. The only thing you can check is the mass balance. It is not possible to know whether the metals are originating from the residual waste of from the wood waste.	
Keeping the information of the origin of the waste as well as getting a uniform understanding among all waste treatment facilities of how to classify different waste types.	
Correction of mistakes in waste data input (system based on user input data) Internal control criteria development and application	
The challenge was to adjust the system to both small and large enterprises.	
The fact that severals systems about waste data already exist with different goals. The ERW (RNDTS) had and still have to take in count theses systems to limit doubling.	
Updating of information in the RPGR, lack of web services for uploading RPGR data in some Regional Administrations.	
- Receiving reports from all obliged reporters in time. - When reporting, we still see wrong combination of codes from the reporters - Once the waste is mixed, it has shown to be difficult to identify and track the waste by using the LoW codes (19 XX XX codes) - The Danish waste data system is constantly under development and we are currently working on an update	
linking of databases of individual waste streams, statistical tool, processing and linking of historical data	
Time consuming and expensive to develop and implement new ERWs	
Alignment/integration The NWCPO, EPA and NTFSP systems developed initially as 3 separate systems. The EPA and NWCPO have worked closely together for a number of years to improve the alignment/integration of the organisations' 2 systems, for example using the same field names and adopting the common usage of unique identifiers, which allows the potential for the systems to be linked. This is being progressed, for example in 2022 data from the NWCPO system was imported for the first time into the EPA system for a subset of 100 priority Local Authority permitted facilities. Once this import process has been streamlined, there is potential for the two systems to be further integrated to ultimately develop a 'national waste flows database' that allows waste to be tracked along the Irish waste management network. The integration with the NTFSO system is not as advanced but is actively being progressed. The NTFSO are currently in the process of updating their system and have committed to adopting the same unique identifiers which will give the potential for an end-to-end track of waste flows through the Irish waste management network. Data Sharing There is a lack of clarity around legal provisions to share waste data, both between individual public authorities (for reporting / enforcement / other purposes) and/or sharing data with the public. This issue requires balancing industry concerns about commercial sensitivity of certain waste data. Resources to develop & maintain systems NWCPO/EPA/NTFSO all have an extensive list of system improvements	

and development work that would be desirable (both at the front-end for reporters and at the back-end for data users), but resources are constantly an issue (availability of IT personnel, budget, competing IT priorities within organisation). Frequency of reporting Currently only annual reporting is required from the majority of waste operators. With the demand for more timely waste indicators to identify key trends / emerging, annual reporting may not be sufficient. The NWCPO have introduced quarterly reporting for household (kerbside) waste collectors. Legal obligation to use the reporting system. The permits / licences vary in terms of what is required from operators – some require an annual environmental report to be provided, some require operators to provide information on request. As mentioned above there is no legal obligation to report using the online EPA/NWCPO systems. However, this has not been a significant issue or been challenged.
Numerous technical and political challenges. The level of detail and related costs for implementation. Several issues were addressed by considering implementation over time, e.g. starting with reporting of waste transfers between entities, followed by reporting of waste transfers between sites, followed by reporting of waste transfers between facilities (including on-site movements).
- data quality assurance: data submission discipline, awareness, including instructions (digital manuals, video, etc.), supervisory capacity.
Slovak electronic register - ISOH, in preparation, needs to be finished.
To develop good software and database which will be user-friendly, but at the same time will collect all necessary data in good quality. To collect all data from operators in good quality and quantity; to teach them how to fulfil data; To teach competent authorities how to conduct QA/QC and validation of the data.
elimination of duplications, data cleaning, prevention of data entry errors
To collect data from all operators. Data quality.
Insufficient data quality control tools, complex and insufficient data output tools
Given the complex administrative division and competencies when it comes to the environment and waste management, the main challenge was to reconcile all the requirements of such a complex arrangement. In addition to the above, there are areas of waste management that are not fully regulated and part of the legislation in waste management is missing.
Development is an ongoing process due to EU WFD and other legal requirements.
This type or registration is already used for decades in the Netherlands. There were not many challenges: It is common sense to register in the data base of Rijkswaterstaat.
coordination with other national authorities on the right of collection of data. Only in January 2019 this is done by law. All licensed polluters report annually to NEA

What challenges have your users reported?	**N° Countries (n = 20)**
Misfunction of the informatic tools	
Classification of waste types; practical issues with database-access.	
Professional waste management companies have the obligation to keep electronic waste registers. In practise they did not all do this yet since a lot of companies report a lot of manual work to collect all the data from paper documents of excel files. Companies report that the different systems they need to report (e.g. CRM, Payments, weighing infrastructure, waste registers are not connected) many companies do not have a central ERP-system with al data coupled, but have separate systems for different purposes.	
Not knowing where the waste came from, either from what municipality or from what industry. Various other bugs, problems logging on to the web portal, not knowing what waste category their waste should be classified as and more.	
data cross-checking between producers, collectors and waste recipients at different stages of waste management	
The RNDTS which is a system conceived to ensure waste, excavated soils and sediments traceability, meets some difficulties in its releasing mainly because users were used to obligations of waste traceability in a paper format. Dematerializing some of these obligations force them stopping some bad habits. Users are generally reporting issues due to these format changes and also about the connection between their own systems with the RNDTS.	
Adapting to the use of a new tool by Public Administrations	
- - The workload for reporting is rather big if they handle many different types of waste from different producers. - Some reporters find the List of Waste codes difficult to understand and use. - The municipalities have had a difficult time login into the system to find data and use it for inspections. - The interface is complex and we are currently improving it for user-friendliness.	
the scope of free published data	
Level of details and amount of information required to be uploaded is time consuming. Also unclear who is required to report and who is and how submitted information is used.	
• Manual input of data means reporting is timing consuming for reporters (multiple rows of data entry). The NWCPO are currently carrying out pilot testing to introduce bulk upload from Excel spreadsheets, which would be a game changer for reporters. • Complexity of information requested, which is needed for European statistical reporting purposes, for example interim and final destinations for exported waste. • Concerns over providing commercially sensitive information, for example the identity of end destination facilities in other countries. • See link to report on EPR user feedback survey: https://www.epa.ie/publications/compliance--enforcement/licensees/reporting/epr-feedback-survey-report.php	
- user-friendly interface; - machine-to-machine automatic data transfer.	
- to learn how to open and use their user accounts; - To learn how to use database and fill all the necessary data; - to report correct data in good quality; - to manage to do all of that inside the deadlines	
Providing data after the improvements have been implemented. (technical issues)	
Waste classification. Reporting time.	
Complexity, unresolved technical problems and errors	
There were a lot of challenges. Ignorance of working on a computer, ways of entering and keeping data, legal regulations, unwillingness to switch from paper to electronic form of reporting. The biggest problem is that the adoption of the obligation to enter data into the Waste Management Information System did not eliminate the obligations of individual institutions (ministries, agencies, etc. on different levels) for the submission of data in paper form, which creates a double reporting obligation	
List of Waste and R/D-codes are challenging to use correctly.	
Not many	
Inconsistency of data, different metric for measurement; report based on self declaration not measured	

Has the ERW enhanced reporting performance in the following ways? (Multiple choices: tick all that apply)	**N° Countries**

	(n = 26)
Reducing administrative overheads	**14**
Increasing reporting rates	16
Improving reporting timing/delivery	19
Other, please specify:	**8**
Improving data quality	
not yet clear since it is only in place since some months and many companies have many problems to report	
It is too soon to measure the added value of the RNDTS, it will reduce administrative charges and provide data about waste, excavated soils and sediments but is first role is to ensure traceability.	
Over the years the number of reporters has increased as more have become aware of their reporting obligations	
- improving data quality; - increased control over data provision.	
increasing information about environment	
Since the system was put into use from January 2021. and that it takes time to determine what all the benefits of the previously proposed have been met.	
Improving data quality. Municipal waste are weighted by NEA. Municipalities are reporting based on weighting results	

Does the system perform automatic verification of the data inserted?	**N° Countries (n = 25)**
yes	15
no	11
Is there a manual verification procedure for data submitted? How often does this take place?	
Depending on waste type: hazardous waste: each case; others: annually	
yes, once per year automatic validations will be introduced in future. A tool to facilitate manual validation will be introduced this summer	
As often as we can manage. We try to go over each and every report once an entity has filed it, to see if it looks right or if there are any mistakes (wrong amount in kg instead of tonnes or wrong treatment registered etc.)	
Yes, there is. The data is annually verified on the basis of reports and in addition - in the case of an inspection.	
The registry performs some electronic check or verification of some data, but others need to be verified manually. The periodicity of this procedure is annual.	
Data manually controlled, manual verification steps such as comparing data with previous years, with waste producer has similar capacity and sectoral (NACE) code etc.	
yes	
Part of the data is automatically controlled in the system. eg the system controls for each company the generation / input of waste and its output which cannot be greater than the generation / input. The second part of the data requires verification in terms of waste transfer between legal entities, confirmation of permits by the competent ministry and the like.	
NO manual	
A manual verification procedure is carried out annually for national and European reporting purposes (annual reporting on municipal waste, annual reporting on waste from economic activities, WEEE reporting, Packages waste reporting etc.) on the data of the national mandatory environmental registry for waste (MUD). Manual verification will be carried on also on the new Electronic registry dataset.	

Does the ERW allow for real-time analysis (e.g. calculating trends or performance towards targets)?	**N° Countries (n = 24)**
yes	9
no	15

The project aims to build knowledge on the use of digital registries for waste across Europe, through the dissemination of some best-practice examples. Such case studies will then help in providing guidance to accelerate the implementation of ERWs in other countries. Would you be willing to provide a case study for the project?	**N° Countries (n =26)**
yes	14
no	12

Annex 4: Exercise of evaluation of the surveys

COUNTRY	Albania	Austria	Belgium (Flemish region)*	Bosnia & Herzegovina	Bulgaria	Croatia	Czechia	Denmark	Estonia	Finland
Q.1 ERW in use?	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
points	10	10	10	10	10	10	10	10	10	10
Q.2.a coverage?	nationwide	nationwide	one region	one region	nationwide	nationwide	nationwide	nationwide	nationwide	nationwide
points	10	10	5	5	10	10	10	10	10	10
Q.3.a single/multiple ERW	single	single	single	multiple	single	single	single	multiple	single	single
points	10	10	5	7	10	10	10	5	10	10
Q.4.a when established?	>3 years	>3 years	<1 year	<1 year	<3 years	>3 years	>3 years	>3 years	>3 years	>3 years
Q.5.a single or multiple competent authorities?	multiple	multiple	single	multiple	single	multiple	multiple	multiple	multiple	multiple
Q.6.a waste streams covered?	4/8	8/8	1/8	8/8	8/8	8/8	8/8	8/8	8/8	8/8
points	4									
Q.6.a.bis All waste codes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes
points	0	10	10	10	10	10	10	10	10	10
Q.6-a-ter Hazardous waste?	yes	yes	no	yes	yes	yes	yes	yes	yes	yes
points	10	10	0	10	10	10	10	10	10	10
Q.6.a.quater other	no	no	no	yes	no	no	yes	no	no	no
points	0	0	0	0,5	0	0	0,5	0	0	0
Q.7.a kind of data contained?	7/12	10/12	5/12	9/12	11/12	10/12	11/12	7/12	8/12	7/12
points	7	10	5	9	11	10	11	7	8	7
Q.7.a.bis other	yes	yes	yes	no	no	no	no	yes	yes	no
points	0,5	0,5	0,5	0	0	0	0	0,5	0,5	0
Q.8.a all step from generation to final treatment are covered?	no	no	yes	yes	yes	yes	yes	no	yes	yes
points	0	0	10	10	10	10	10	0	10	10
Q8-bis doubling data prevention	yes	yes						yes		
points	0,5	0,5	0	0	0	0	0	0,5	0	0
Q.9.a entities registered?	8/10	6/10	5/10	8/10	6/10	6/10	8/10	2/10	6/10	4/10
points	8	6	5	8	6	6	8	2	6	4
Q.9.a.bis other	no	yes	yes	yes	no	no	no	yes	no	no

COUNTRY	Albania	Austria	Belgium (Flemish region)*	Bosnia & Herzegovina	Bulgaria	Croatia	Czechia	Denmark	Estonia	Finland
points	0	0,5	0,5	0,5	0	0	0	0,5	0	0
Q.10a description of exceptions	no	yes	no	no	no	no	yes	yes	no	yes
Q.11.a reporting obligation for entities?	by law periodically	by law periodically	by law periodically	by law periodically	by law periodically	by law periodically	by law periodically	by law periodically	by law periodically	by law periodically
Q.12.a how often data are submitted?	annually	other	monthly	other	annually	annually	other	other	other	annually
Q.12.a.bis other	no	yes	no	yes	no	no	yes	yes	yes	no
Q.13.a is ERW the primary method?	yes	yes	no	yes	yes	yes	yes	yes	yes	yes
points	10	10	0	10	10	10	10	10	10	10
Q.13.1.a other methods	no	no	yes	no	no	no	no	no	no	no
points	0	0	0,5	0	0	0	0	0	0	0
Q.14.a which users?	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Q.15.a interconnection of the ERW?	no	yes	yes	yes	no	no	yes	no	yes	yes
points	0	10	10	10	0	0	10	0	10	10
Q.16.a access to the ERW?		web portal	web portal	web portal	web portal	web portal	web portal/software	web portal	web portal	web portal
cont.	0	10	10	10	10	10	15	10	10	10
Q.16.a.bis other	yes	no	yes	no	no	no	yes	no	no	yes
points	0,5	0	0,5	0	0	0	0,5	0	0	0,5
Q.16.1.a link to web portal?	no	yes	yes	yes	yes	yes	yes	yes	yes	yes
points	0	1	1	1	1	1	1	1	1	1
Q.17.a how is data collected?	manually	both	manually	both	both	manually	both	both	both	both
points	5	10	5	10	10	5	10	10	10	10
Q.18.a challenges in development?	yes	yes	yes	yes	no	yes	yes	yes	yes	yes
points	1	1	1	1	0	1	1	1	1	1
Q.19.a challenges reported?	yes	no	yes	yes	no	yes	yes	yes	yes	yes
points	1	0	1	1	0	1	1	1	1	1
Q.20.a enhanced reporting performance?	1/3	3/3	0/3	0/3	3/3	3/3	3/3	2/3	3/3	3/3
points	1	3	0	0	3	3	3	2	3	3

COUNTRY	Albania	Austria	Belgium (Flemish region)*	Bosnia & Herzegovina	Bulgaria	Croatia	Czechia	Denmark	Estonia	Finland
Q.20.a.bis other	yes	no	no	no	no	yes	no	yes	yes	no
points	0,5	0	0	0	0	0,5	0	0,5	0,5	0
Q.21.a automatic data verification?	no	yes	no	no	yes	yes	yes	yes	yes	yes
points	0	5	0	0	5	5	5	5	5	5
Q.21.1.a manual data verification?	no	no	yes	yes	no	no	no	no	no	no
points	0	0	1	1	0	0	0	0	0	0
Q.22.a real time analysis?	no	yes	no	yes	no	yes	no	yes	no	no
points	0	5	0	5	0	5	0	5	0	0
Q.23.a case study?	yes	yes	yes	yes	no	yes	yes	yes	yes	no
points	1	1	1	1	0	1	1	1	1	0
TOTALE	**80**	**123,5**	**82**	**120**	**116**	**118,5**	**137**	**102**	**127**	**122,5**

*answers adapted to one administrative region
Source: ISPRA elaboration on respondent data

COUNTRY	France	Germany	Greece	Hungary	Iceland	Ireland	Italy	Latvia	Lithuania	Luxembourg
Q.1 ERW in use?	yes	no	yes	yes	yes	yes	yes	yes	yes	no, in development
points	10	0	10	10	10	10	10	10	10	1
Q.2.a coverage?	nationwide		nationwide	nationwide	nationwide	nationwide	nationwide	nationwide	nationwide	
points	10	0	10	10	10	10	10	10	10	0
Q.3.a single/multiple ERW	multiple		single	single	single	multiple	multiple	multiple	single	
points	7	0	10	10	10	5	5	7	10	0
Q.4.a when established?	<1 year		>3 years	>3 years	>3 years	>3 years	>3 years	>3 years	>3 years	
Q.5.a single or multiple competent authorities?	single		single	single	multiple	multiple	single	single	multiple	
Q.6.a waste streams covered?	8/8		8/8	8/8	8/8	8/8	8/8	8/8	8/8	0/8
points										
Q.6.a.bis All waste codes	yes		yes	yes	yes	yes	yes	yes	yes	
points	10		10	10	10	10	10	10	10	1
Q.6-a-ter Hazardous waste?	yes		no	no	yes	yes	yes	no	no	no
points	10		0	0	10	10	10	0	0	0
Q.6.a.quater other	yes		no	no	no	no	no	no	no	no
points	0,5		0	0	0	0	0	0	0	0
Q.7.a kind of data contained?	9/12		9/12	11/12	7/12	9/12	11/12	7/12	10/12	0/12
points	9		9	11	7	9	11	7	10	0
Q.7.a.bis other	yes		no	no	yes	no	yes	no	no	no
points	0,5		0	0	0,5	0	0,5	0	0	0
Q.8.a all step from generation to final treatment are covered?	yes		yes	yes	no	no	yes	yes	yes	no
points	10		10	10	0	0	10	10	10	
Q8-bis doubling data prevention					yes	yes				
points	0		0	0	0,5	0,5	0	0	0	
Q.9.a entities registered?	5/10		4/10	7/10	2/10	5/10	6/10	4/10	5/10	0/10
points	5		4	7	2	5	6	4	5	0
Q.9.a.bis other	yes		yes	no	yes	no	no	no	no	no
points	0,5		0,5	0	0,5	0	0	0	0	0

COUNTRY	France	Germany	Greece	Hungary	Iceland	Ireland	Italy	Latvia	Lithuania	Luxembourg
Q.10a description of exceptions	yes		no	yes	yes	no	no	yes	yes	no
Q.11.a reporting obligation for entities?	by law periodically		by law periodically	by law periodically	by law periodically	by law periodically	by law periodically	by law periodically	by law periodically	
Q.12.a how often data are submitted?	other		annually	annually	other	annually	annually	annually	annually	
Q.12.a.bis other	yes		no	no	yes	no	no	no	no	no
Q.13.a is ERW the primary method?	no		no	yes	yes	yes	yes	yes	yes	no
points	0		0	10	10	10	10	10	10	0
Q.13.1.a other methods	no		yes	no	no	no	no	no	no	no
points	0		0,5	0	0	0	0	0	0	0
Q.14.a which users?	yes		yes	yes	yes	yes	yes	yes	yes	no
Q.15.a interconnection of the ERW?	yes		yes	no	no	yes	no	yes	yes	no
points.	10		10	0	0	10	0	10	10	0
Q.16.a access to the ERW?	web portal		web portal	web portal	web portal	web portal	web portal	web portal	web portal	
points	10		10	10	10	10	10	10	10	0
Q.16.a.bis other	yes		no	no	no	no	yes	no	no	no
points	0,5		0	0	0	0	0,5	0	0	0
Q.16.1.a link to web portal?	yes		yes	yes	yes	yes	yes	yes	yes	no
points	1		1	1	1	1	1	1	1	0
Q.17.a how is data collected?	both		manually	manually	manually	manually	manually	manually	both	
points	10		5	5	5	5	5	5	10	0
Q.18.a challenges in development?	yes		yes	yes	yes	yes	no	yes	yes	no
points	1		1	1	1	1	0	1	1	0
Q.19.a challenges reported?	yes		yes	yes	yes	yes	no	yes	yes	no
points	1		1	1	1	1	0	1	1	0
Q.20.a enhanced reporting performance?	1/3		3/3	1/3	1/3	3/3	3/3	2/3	1/3	0/3
points	1		3	1	1	3	3	2	1	0
Q.20.a.bis other	yes		no	no	no	no	no	no	no	no

COUNTRY	France	Germany	Greece	Hungary	Iceland	Ireland	Italy	Latvia	Lithuania	Luxembourg
points	0,5		0	0	0	0	0	0	0	0
Q.21.a automatic data verification?	yes		no	yes	no	yes	no	yes	yes	no
points	5		0	5	0	5	0	5	5	0
Q.21.1.a manual data verification?	no		no	no	yes	no	yes	no	no	no
points	0		0	0	1	0	1	0	0	0
Q.22.a real time analysis?	no		no	no	no	yes	no	no	yes	no
points	0		0	0	0	5	0	0	5	0
Q.23.a case study?	no		yes	no	no	yes	yes	no	no	no
points	0		1	0	0	1	1	0	0	0
TOTALE	**112,5**	**0**	**96**	**102**	**90,5**	**111,5**	**104**	**103**	**119**	**2**

Source: ISPRA elaboration on respondent data

COUNTRY	Malta	Montenegro	Poland	Portugal	Romania	Slovak Republic	Spain	Sweden	Switzerland	The Netherlands	Turkiye
Q.1 ERW in use?	no, in planning	no, in planning	yes	no	yes	yes	yes	yes	yes	yes	yes
points	0,5	0,5	10	0	10	10	10	10	10	10	10
Q.2.a coverage?			nationwide		nationwide	nationwide	nationwide	nationwide	nationwide	nationwide	nationwide
points	0	0	10	0	10	10	10	10	10	10	10
Q.3.a single/multiple ERW			single		single	single	single	multiple	single	single	
points	0	0	10	0	10	10	10	5	10	10	0
Q.4.a when established?			>3 years		>3 years	>3 years	1-3 years	>3 years	>3 years	>3 years	>3 years
Q.5.a single or multiple competent authorities?			multiple		single	single	multiple	multiple	single	multiple	multiple
Q.6.a waste streams covered?	0/8	0/8	8/8		7/8	8/8	8/8	7/8	0/8	8/8	4/8
points					7			7			4
Q.6.a.bis All waste codes			yes		no	yes	yes	no	no	yes	no
points	0	0	10		0	10	10	0	0	10	0
Q.6-a-ter Hazardous waste?	no	no	yes		yes	no	yes	yes	yes	yes	yes
points	0	0	10		10	0	10	10	10	10	10
Q.6.a.quater other	no	no	yes		no	no	no	yes	no	no	no
points	0	0	0,5		0	0	0	0,5	0	0	0
Q.7.a kind of data contained?	0/12	0/12	11/12		8/12	11/12	11/12	10/12	6/12	8/12	6/12
points	0	0	11		8	11	11	10	6	8	6
Q.7.a.bis other	no	no	yes		no	no	no	no	no	no	no
points	0	0	0,5		0	0	0	0	0	0	0
Q.8.a all step from generation to final treatment are covered?	no	no	yes		yes	no	yes	yes	no	yes	yes
points			10		10	0	10	10	0	10	10
Q8-bis doubling data prevention						yes			yes		
points			0		0	0,5	0	0	0,5	0	0
Q.9.a entities registered?	0/10	0/10	8/10		6/10	8/10	8/10	9/10	5/10	1/10	3/10
points	0	0	8		6	8	8	9	5	1	3
Q.9.a.bis other	no	no	yes		no	no	no	no	no	no	no
points	0	0	0,5		0	0	0	0	0	0	0

COUNTRY	Malta	Montenegro	Poland	Portugal	Romania	Slovak Republic	Spain	Sweden	Switzerland	The Netherlands	Turkiye
Q.10a description of exceptions	no	no	yes		no	no	no	no	no	no	yes
Q.11.a reporting obligation for entities?			by law immediately		by law periodically	by law periodically	by law immediately	by law immediately	by law immediately	by law periodically	by law periodically
Q.12.a how often data are submitted?			other		annually	annually	other	other	other	monthly	annually
Q.12.a.bis other	no	no	yes		no	no	yes	yes	yes	no	no
Q.13.a is ERW the primary method?	no	no	yes		yes	yes	no	yes	no	no	no
points	0	0	10		10	10	0	10	0	0	0
Q.13.1.a other methods	no	no	no		no	no	yes	no	yes	yes	yes
points	0	0	0		0	0	0,5	0	0,5	0,5	0,5
Q.14.a which users?	no	no	yes		yes	yes	yes	yes	yes	yes	yes
Q.15.a interconnection of the ERW?	no	no	no		no	no	yes	yes	yes	yes	yes
points	0	0	0		0	0	10	10	10	10	10
Q.16.a access to the ERW?			web portal		web portal	web portal/software	web portal	web portal	web portal	web portal	web portal
points	0	0	10		10	15	10	10	10	10	10
Q.16.a.bis other	no	no	no		no	no	no	no	no	no	no
points	0	0	0		0	0	0	0	0	0	0
Q.16.1.a link to web portal?	no	no	yes		yes	yes	yes	yes	yes	yes	yes
points	0	0	1		1	1	1	1	1	1	1
Q.17.a how is data collected?			both		manually	both	manually	both	manually	both	manually
points	0	0	10		5	10	5	10	5	10	5
Q.18.a challenges in development?	no	no	yes		yes	yes	yes	yes	yes	yes	no
points	0	0	1		1	1	1	1	1	1	0
Q.19.a challenges reported?	no	no	no		yes	no	yes	yes	yes	yes	no
points	0	0	0		1	0	1	1	1	1	0
Q.20.a enhanced reporting performance?	0/3	0/3	2/3		2/3	0/3	3/3	2/3	1/3	2/3	2/3
points	0	0	2		2	0	3	2	1	2	2

COUNTRY	Malta	Montenegro	Poland	Portugal	Romania	Slovak Republic	Spain	Sweden	Switzerland	The Netherlands	Turkiye
Q.20.a.bis other	no	no	no		yes	no	yes	no	no	no	no
points	0	0	0		0,5	0	0,5	0	0	0	0
Q.21.a automatic data verification?	no	no	no		yes	no	no	yes	no	yes	no
points	0	0	0		5	0	0	5	0	5	0
Q.21.1.a manual data verification?	no	no	yes		no	yes	yes	no	yes	no	yes
points	0	0	1		0	1	1	0	1	0	1
Q.22.a real time analysis?	no	no	yes		no	no	yes	no	no	yes	no
points	0	0	5		0	0	5	0	0	5	0
Q.23.a case study?	no	no	no		no	no	yes	yes	no	yes	no
points	0	0	0		0	0	1	1	0	1	0
TOTALE	**0,5**	**0,5**	**120,5**	**0**	**106,5**	**97,5**	**118**	**122,5**	**82**	**115,5**	**82,5**

Source: ISPRA elaboration on respondent data

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