

The future of eReporting and the link to INSPIRE

Concept note
(version: 18 May 2017)

Context:

At their meeting on 3 June 2016, the Directors of DG ENV (Aurel Ciobanu-Dordea) and EEA (Hans Bruyninckx) agreed that we are at a crucial moment in the implementation process for the INSPIRE Directive and that clarity on the strategic direction regarding the EU level use of INSPIRE in relation to reporting under environment policies, There was a commitment to develop such a strategic direction jointly. Hence, it was agreed to develop a strategic concept document on "The future of eReporting and the link to INSPIRE". This conceptual note would aim at resolving the issues discussed over the past and today and creating a common understanding and ambition level and a joint DG ENV/EEA long term perspective ("landing zone") of where we intend to go together. It will then become the basis to translate this into a realistic multiannual planning with clear priority setting and linked to the environment policy and reporting agenda as it foreseeable for the coming years.

This document responds to this request and represents the common view of DG ENV and the EEA at the point of drafting. A wide consultation with Member State experts working with DG ENV (e.g. in the context of INSPIRE or under the various reporting groups) and with the EEA (e.g. in the context of EIONET) took place between October 2016 and January 2017. Several comments were received and led to a revision of this document.

This revised version is still considered a living document as it will need to be developed and refined further as implementation of this concept unfolds. However, it is the intention of DG ENV and the EEA that this version will now be applied in selected areas. This would allow to demonstrate in more detail what the application of this concept means in practice. An initial implementation will be done as a follow up to the Reporting Fitness Check. Some discussions in thematic areas are already ongoing (e.g. water, industrial emissions, ...). The work on this will be presented and discussed in the sub-group established under the INSPIRE MIWP (action 2016.5), the respective EIONET group(s) and the thematic groups that are concerned. In late 2017/early 2018, DG ENV and the EEA will review this concept note in the light of developments, and revise it, if and as necessary.

Any comments on the document or question to this work can be sent to joachim.d'eugenio@ec.europa.eu and stefan.jensen@eea.europa.eu.

1. Introduction and background

The European Environment Agency (EEA) has been pioneering the use of electronic tools in the context of reporting and information management (eReporting) at EU level since the Nineties, e.g. with the development of Reportnet. It also took a leading role in developing integration and streamlining through sectorial initiatives such as WISE and BISE. The development and adoption of the INSPIRE Directive in 2007 is regarded as a significant milestone which, amongst other benefits¹, would further promote eReporting

¹ INSPIRE was also developed to support further integration of various reporting obligation by developing common generic models for e.g. object identification, semantic harmonization. IT also reflects the global ICT developments (web based, distributed system), stressing the importance of data providers-administrators in individual MS.

and streamline and improve spatial data management for the benefit of environment policy making and assessment. Whilst some specific adaptations towards advanced eReporting have been implemented (e.g. regarding reporting on nature or water), some pilot cases have been tested and led to early implementation as regards moving towards interoperability (e.g. air quality) or work is in progress (e.g. IED, ePRTR reporting), a widespread use of online web-based services for eReporting as applied for the implementation of INSPIRE has yet to materialise.

This concept paper addresses eReporting from the national to the European level and can potentially be reflected on the regional level. What does the use of an INSPIRE approach for this eReporting mean? In short, the INSPIRE Directive promotes a decentralised spatial data management with demanding interoperability requirements (set out in Implementing Rules) to ensure multi-use of the spatial data based on the principles of a shared environmental information system. In contrast, the existing Reportnet is a largely centralised system used by countries for eReporting by means of transferring files to a central data repository. The rules, terminology (code lists) and format requirements are dependent on the thematic data flow which is resulting in a diversity of reporting processes that have developed in different sectorial areas over time.

According to the EEA, the main reasons why INSPIRE obligations are not yet featuring more widely in eReporting to date, are challenges due to:

- Inconsistent implementation timescales: thematic reporting obligations and rules have been developed prior to the deadlines from the INSPIRE legislation;
- The complexity introduced to data models by INSPIRE requirements and potential system lock-in to current INSPIRE and thematic requirements;
- The provisions related to environmental spatial data are covered mainly by Annex III were published only after many reporting obligations were already in place (last implementing rule was published only in December 2013) and require newly collected or heavily changed data sets (Reporting data generally falls under this category) to be published by 2015 and others by 2020;
- Lack of resources and technical capacity in Member States. Many thematic stakeholders are hesitating and challenge the overall interoperability approach and the benefits of the necessary investment.

The progress on implementing the INSPIRE Directive has also been analysed in a REFIT evaluation which was recently published². With regard to eReporting, it recognises the progress and highlights some of the challenges (see pages 59-60 of SWD). Most importantly, most Member States have not (yet) made the key environmental datasets available "as is" (i.e. in the way they exist at the moment without having made them interoperable) and indications are that making them "interoperable" which is due in 2017 or 2020 will be a significant challenge for Member States. This highlights the risk that the eReporting process will not benefit from the INSPIRE Directive as it was originally intended.

As a consequence, the Commission has decided on a set of actions (in the recommendations of the report) which should help manage that risk and unleash the potential of the INSPIRE Directive approach for eReporting. These actions are (extract of the INSPIRE report² those relevant for eReporting):

- Member States are recommended to give priority to spatial data sets required for the implementation of EU environmental law in the further implementation of the

² COM(2016) 478 and SWD(2016)273: <http://inspire.ec.europa.eu/index.cfm/newsid/11955>

INSPIRE Directive, in particular monitoring and reporting, as well as data sets identified in relevant global processes.

- the Commission will
 - review and, possibly revise, the INSPIRE implementing acts, in particular on the spatial data harmonisation, to take into account the implementing risks and the complexities with the view to reducing them (simplification of requirements),
 - improve the simplification of use of existing INSPIRE rules, data and services, e.g. making it easier for users in the area of monitoring and reporting through common tools and foster priority setting together with the Member States,
 - further promote the implementation of INSPIRE services and data harmonisation in relevant EU initiatives (e.g. Copernicus, Horizon 2020), Commission services, European agencies and international partners to the EU.

These and other relevant actions were discussed between the Commission services, assisted by the European Environment Agency, and the Member States in the context of the ongoing INSPIRE Maintenance and Implementation Framework and a preliminary work programme for 2016-2020 has been discussed on the meeting of 29 June 2016

INSPIRE is now also more widely endorsed in the Digital Single Market agenda, in particular by the European Interoperability Framework³ and also the eGovernment Action Plan that specifically mentions INSPIRE as a way to facilitate digital interaction between administrations and citizens/businesses for high-quality public services.⁴

Moreover, the Fitness Check on Environmental Monitoring and Reporting⁵ expects the INSPIRE Directive as a tool with huge potential for streamlining the reporting process and improve efficiency, effectiveness and coherence of spatial data management.⁶ In particular the actions 3 (modernising eReporting), 4 (developing harvesting tools) and 6 on promotion of full INSPIRE implementation) in the Commission's Report on streamlining environmental reporting are of relevance when using INSPIRE for eReporting purposes.

This concept paper is a contribution to these processes by mapping out the future role of INSPIRE in eReporting for environment policy and encouraging Member States and EU institutions and bodies to work towards such an agenda and to establish transitional arrangements, as appropriate, to move from the current reporting process to a more effective and efficient one using the INSPIRE approach as one of the important elements to achieve this.

2. Current situation and "problem definition"

When the INSPIRE Directive was designed, one of the important use cases (but not the only one) at EU level was to facilitate reporting. This is why many of the themes listed in the Annexes of the INSPIRE Directive make reference to relevant geospatial data which stem from EU environment legislation (e.g. hydrography in Annex I makes reference to the Water Framework Directive and another theme in Annex III is on area management, restrictions regulation zone and reporting units). Furthermore, during the development of the Implementing Rules for data interoperability, the existing reporting legislation and flows were initially analysed and used as drivers for the development of the harmonised data models. Over the years, the use of the specifications set by the INSPIRE Directive

3 COM(2015)192

4 COM(2016) 179 final

⁵ See SWD(2016)188 (http://ec.europa.eu/environment/legal/reporting/fc_overview_en.htm)

⁶ https://ies-svn.jrc.ec.europa.eu/projects/mig-p/wiki/4th_MIG-P_meeting

has been increasingly discussed in many reporting areas and in practice, stepwise progress in alignment of the data specifications has been achieved to a larger or lesser degree depending on the area. The new implementation of the ambient air quality directive⁷ is using INSPIRE specifications but has not yet matured in transformations of the entire reporting system where also necessary services are being put in place. It means that, although the data for reporting is already compliant to INSPIRE and tools are now available and in use by MS to report these data, the distributive services are not yet available in all MS. Also, only a subset of Member States has so far succeeded in the data flow implementation according to INSPIRE in relation to some reporting data themes.

An increasing number of Member States is making their geospatial datasets available through INSPIRE compatible services. E.g. the Netherlands has put together a data service which allows accessing environmentally relevant digital geographic data via web services⁸. And several other Member States (e.g. ES, RO) demand that once they made the efforts in investing in the implementation of the INSPIRE Directive for environmental data, they should be able to report these datasets directly to the Commission or the EEA without making any further efforts or transformations. However, this progress at national level is "patchy" and the majority of Member States is not ready and is likely not to be ready for years to come (given the delays in the implementation), e.g. because of a different understanding of which datasets support "*purposes of Community environmental policies*" as written in article 1 chapter 1 of directive 2007/2/EC. To overcome these issues, a list of priority datasets for eReporting⁹ has been developed in the meantime. Without most, or all, of the Member States having transformed their relevant datasets to the INSPIRE model, it is therefore difficult to establish EU level applications to use these data more easily.

At the EEA, the use of INSPIRE services for integrated environmental assessments and reporting on the state and outlook of Europe's environment is currently still limited. Some progress has been made for the above-mentioned air quality and for the CDDA reporting which is part of the Eionet core data flows.

But the current approach and business process for eReporting by countries is based on Reportnet where, in short, predefined files (whether it be a .pdf, a .xml, a shape file or other formats) are transferred by the Member States in a Common Data Repository after which they are quality checked and processed often in diverse manners depending on the arrangements in the different policy reporting areas. It can be noted in general that the processes used in the different thematic reporting areas are diverse. The inventory on the Reporting Fitness Check has illustrated this diversity without going into the details of the technical specifications.

During the evaluation on the INSPIRE Directive and during collaboration with the various reporting domains, there are a number of issues which arose regularly when talking about this interaction INSPIRE/eReporting, in particular:

- Since INSPIRE was aiming at establishing cross-domain and re-usable data models, the legally binding terminology and definitions used in a specific policy domain are sometimes different from the terminology of the INSPIRE Directive (e.g. the term agglomeration does not appear directly in the INSPIRE data model; the definitions for the exactly same industrial reporting unit are sometimes different in sectorial legislation (e.g. IED versus EPRTR).

⁷ "Reporting and exchanging air quality information using e-Reporting", EEA Technical Report No. 5/2012

⁸ <https://www.pdok.nl/en/node>

⁹ The first version of this list is available and will be regularly updated at:

<https://ies-svn.jrc.ec.europa.eu/projects/2016-5>

- The transformation of environmental spatial data into the data models set out in the interoperability specifications (with the last implementing rule only adopted in 2013) requires efforts, which depending on the available skills and capacity, are not always evident if the benefits do not justify such investments.
- Also often the reporting data flows pre-date the agreement of the INSPIRE data models which means that the existing reporting data models (if any) have been used for years. Re-engineering these flows only for the sake of INSPIRE, without explaining eventual wider benefits, is difficult to do.
- There is a lack of common understanding which data or datasets contribute to "*purposes of Community environmental policies*" as written in article 1 chapter 1 of directive 2007/2/EC, which has to be overcome by concrete lists (e.g. see footnote 2) and more concrete definitions on art. 1 chapter 1 of directive 2007/2/EG e.g. in Technical Guidance documents.
- The understanding of the technical aspects of INSPIRE and how this translates into a particular policy area or data management in a certain area is limited. INSPIRE is often portrayed as (too) complex. The (reporting) users mainly want to know "how can they make their datasets INSPIRE compliant without compromising their other policy objectives?" and "what would be the benefits?". As far as the EEA is concerned, these questions did not seem to be answered convincingly in the past. Hence, the EEA did not yet modified the existing Reportnet tools towards an eReporting system incorporating web based services for active dissemination by Member States as applied for the implementation of INSPIRE web based services.
- During the development of the INSPIRE data specifications, reporting use cases have been taken into account to a different degree. Therefore, the available data specifications have different fit-for-purpose levels when applied in the eReporting context.
- Reporting information is often a mix of numeric, spatial and other information including a lot of textual elements. Since INSPIRE only deals with spatial data, there was often a separate discussion only for spatial data. For the other information, independent data models or business processes were developed. With the exception on of plans and programmes reporting under the air quality reporting, there were rarely holistic or integrated solutions put in place which also would fit with INSPIRE.
- It has to be noted that data validation has to be organised differently when (partially) shifting to service based reporting.

On all these (and other issues), no conclusive discussions took place on how these issues could be solved across the various policy domains so as to develop and transform the eReporting process in the future. This concept paper is now an opportunity to address these issues and develop a concept that everybody can sign up to due to its added value.

3. Common understanding

Besides putting data-sharing policies in place allowing access and use of spatial data across boundaries and sectors, the INSPIRE Directive set out a number of obligations for the entire spatial data management process. It requires Member States to:

1. Identify the relevant spatial datasets.
2. Ensure that the identified datasets are documented using certain standards (metadata).
3. Make the identified data accessible and available through a number of different web based services (discovery, viewing, download, ...).
4. Transform the identified datasets into pre-defined data models for the purpose of increased interoperability.

The first question is, hence, what are spatial datasets. According to the definitions in the INSPIRE Directive: '*spatial data set*' means an identifiable collection of spatial data (Article 3.3) and '*spatial data*' means any data with a direct or indirect reference to a specific location or geographical area (Article 3.2). This covers potentially a wide variety of environmental and other data. It includes the geographic reference points (such as the location of a monitoring station or area management) but also the environmental data being collected (i.e. the concentration of a pollutant in the environment or the pollution load of a discharge). The scope of the INSPIRE Directive is defined by Article 4 which includes all spatial data sets as long as they fulfil the conditions (a) to (d).

It could be argued that most or all information that is currently reported under EU environment legislation has a geospatial component, including any permit, exemption, plan or programme, a competent authority etc. Somehow all is linked to a location or a place. Nevertheless, it is meaningful to distinguish between three groups of data¹⁰ of which the first two are covered by the INSPIRE Directive definition of spatial data:

1. The geospatial reference data which enable to prepare maps or data viewers (such as zones administrative boundaries, elevation, river or transport networks, locations of pollution sources, etc.) (*let's call them type 1 data*).
2. The environmental or other business data (or attributes for geospatial reference data) which are connected to a geographic location (such as the state-of-the-environment data, pollution loads or concentrations, statistics, etc.) (*let's call them type 2 data*).
3. The textual and contextual data linked to a certain geographic location (such as the river basin or waste management plans, the permits, the exemptions or the methodologies used for monitoring, etc.) (*let's call them type 3 data*).

Whilst a holistic approach is needed to integrate all these different data using its geographic location for specific user applications or services, it makes sense to focus or prioritise on particular issues related to INSPIRE when improving the eReporting. The biggest strength of INSPIRE is the management of the type 1, namely the discovery, accessibility and availability of interoperable geospatial reference data from data providers.

The Directive itself does not pose any obligations on applying these provisions also at the EU institutions and bodies (incl. the EEA). However, there is a clear commitment of doing so. Also at the national level, the advancement of applying INSPIRE for reporting is at the early stages (see above).

When looking through the four spatial data management steps in INSPIRE (see above), the INSPIRE REFIT evaluation and the bilateral meetings found that already the first step, the identification of relevant datasets is not completed in most Member States. To address and rectify this, a list of priority datasets or groups of such datasets has been compiled by recently and a first version is now available online¹¹. This (living) list should facilitate identifying the most important spatial datasets listed in environmental reporting obligations which all Member States must¹² make available through the INSPIRE framework. This list will, by no means, be complete and exhaustive but it can become a valuable tool to ensure that focus is on the most relevant issues when it comes to the environmental eReporting use case. It is a first and useful step to enumerate datasets

¹⁰ The introduction of this terminology is mainly to facilitate discussions and common understanding. It will need further refinement when implementing this concept paper.

¹¹ See footnote 2. Originally, this was proposed in DOC10 at [https://ies-svn.jrc.ec.europa.eu/projects/mig-p/wiki/4th MIG-P meeting](https://ies-svn.jrc.ec.europa.eu/projects/mig-p/wiki/4th_MIG-P_meeting)

¹² The deadline of the obligations in the INSPIRE Directive for doing so are already in the past.

covered by article 1 chapter 1 of the directive which means, they contribute to "*purposes of Community environmental policies*".

As regards the metadata, Member States have made good advancements. The next efforts would hence have to be to make available online the identified priority spatial datasets needed for reporting, through the various existing services in the form that these data exist. In other words, no transformation to the interoperability standards must be undertaken yet¹³, the data can and should be made available "as is". This would already improve the current situation and allow improved eReporting at EU level. One element that is currently missing is that the metadata do not specify whether a dataset is part of an "official" dataset for reporting under a particular EU legislation. An approach needs to be developed (e.g. additional codes to the metadata for reporting datasets) to indicate this in both – the EU geoportal and the eReporting system. Introducing such metadata information would make it much easier to find and use these data. One option would be to select in the user interface of the EU geoportal data based on official reporting obligations.

When it comes to the transformation of the datasets into common data models, this needs further discussions since an agreement has to be reached that these data models (e.g. to extended data models for reporting use cases by a thematic ID) are applied also at EU level. The purpose of the concept paper and the proposed actions below is to trigger such a discussion in the appropriate groups.

Moreover, it makes sense to structure the considerations also alongside the data processing chain and to see how INSPIRE can be used to make this process more effective and efficient.

At present ("status quo"), the following main data processing steps take place for reporting (assuming that the reporting takes place to the EEA):

1. Member States compile and prepare the datasets at their end. This includes a QA/QC process agreed at EU level.
2. Member States submit the datasets by "depositing" them in the CDR in the agreed format. End user tools or online data forms are often provided from the EU level.
3. The EEA (or other service providers) carry out QA/QC processes, if necessary going back to the MS asking for correction and re-submission of the data.
4. The EEA (or other service providers) integrates the various national datasets into European datasets.
5. The EEA (or other service providers) is producing indicators, assessments, reports or other information products and services using these datasets and publish those. The most common product using spatial data are online map viewers¹⁴. Several end-user applications exist such as BISE¹⁵, WISE¹⁶, E-PRTR¹⁷, etc.

Under the INSPIRE Directive, Member States have to provide information on monitoring and reporting of implementation. The EU geoportal was designed to allow accessing the actual datasets falling under INSPIRE. It is fair to say that this current system is also in need for improvement since currently the geoportal does not fulfil its purpose and is not user-friendly. Work is ongoing to address these issues.

¹³ Deadlines for transforming datasets to common models are in 2017 or 2020.

¹⁴ See http://www.eea.europa.eu/data-and-maps/explore-interactive-maps#c5=&c0=5&b_start=0

¹⁵ <http://biodiversity.europa.eu/>

¹⁶ <http://water.europa.eu/>

¹⁷ <http://prtr.ec.europa.eu/#/home>

4. Vision and long term objectives

In an ideal world, the accessibility and usability of all existing (environmental) data would be complete and easy in practice. Anybody should be able at any time to get access and use the data they need for their work without obstacles. More time could be spent on the analysis and use of the data, then on finding them and putting them into formats that allow using them for the respective purposes.

In reality, this is far from being the case for environmental spatial data reported to the EU Institutions at the moment and will be highly challenging to achieve. Nevertheless, the long-term objectives for eReporting and the use of the European spatial data infrastructure for eReporting offered by INSPIRE should be:

- to ensure that environmental data and relevant spatial data, are made available without obstacles, are easy to find and can be used and re-used limiting the need to transforming or modifying them. Member States and EU institutions and bodies should continue to work closely together;
- to use the opportunity offered by the Reporting Fitness Check process to simplify thematic reporting (reduce reporting burden) and to identify common areas which can be supported by the interoperability aspects of INSPIRE;
- to use the provisions of the INSPIRE Directive to a relevant extent so as to make the data management (including active dissemination) and reporting process more efficient and effective. This would be achieved by first and foremost investing in EU wide priority spatial datasets and defining what the relevant extent is;
- to foster a shift from transferring data to the EU level to making data accessible at source and securing active dissemination at national level through eGovernment services, allowing the use and harvesting of these data by anybody, including the EU institutions and bodies;
- to develop together powerful search and harvesting tools;
- to move to a practice of sending often the same of very similar data many times to EU institutions, to a practice where the data is published once by the MS and it is used many times for different purposes by the EU institutions and others.
- to continue data transmission to the EU level¹⁸ for priority spatial datasets as identified for the MIWP¹⁹, which are essential for policy development, implementation and evaluation. Such priority datasets may act as a pointer to the big data pool available at national level in case more details are needed.

In conclusion, the further development of eReporting using the INSPIRE approach should lead to a significant efficiency and effectiveness gain over the coming years with the perspective to further develop and transform the current reporting business process over the coming 10 years or so. This will require investments at national and EU level but should not only result in efficiency gains which would outweigh the investments but also improve the possibilities of using the environmental data for more integrated assessments or forecasting models. This long-term objective should be pursued in such a way that everybody is a "winner" (or can harvest benefits) at the end.

5. Overall approach

To move forward, a stepwise and pragmatic approach will be needed. It should allow taking small(er) steps and testing their benefits without putting longer term objectives and higher ambition levels into question. It should also ensure that eReporting is done in a more coherent and streamlined way and reduce fragmentation of approaches or technical solutions as they exist at the moment.

¹⁸ This will be necessary, at least during a period of transition, until a fully decentralised vision can be made operational.

¹⁹ See DOC10 at https://ies-svn.jrc.ec.europa.eu/projects/mig-p/wiki/4th_MIG-P_meeting

As far as the INSPIRE implementation and interoperability is concerned, the introduction of the "maturity level" concept (see pages 17/18 of the INSPIRE MIWP²⁰) is designed to promote such a step-by-step approach. The definition of INSPIRE specifications which fulfil either "basic", "essential" or "premium" maturity levels allows for a gradual and feasible transition, towards interoperability will help focus on priorities and quick wins and will allow frontrunners to move forward quicker and test more advanced solutions. As part of this eReporting concept, the definitions of what "basic", "essential" or "premium" stands is going to be defined in the context of the "fitness for purpose" action 2016.1 under the INSPIRE MIWP. It should ideally be generic and not "use case driven".

As introduced above, it is meaningful to distinguish between three groups of data for developing the eReporting approach:

The **geospatial reference data** (type 1) which enable to locate environmental information and to prepare maps or viewers (such as administrative boundaries, elevation, river or transport networks, locations of pollution sources, reference grids, reporting units etc.). This constitutes the minimum of compliant INSPIRE implementation which can be expected from the Member States. The **environmental data** (type 2) which are connected to the reference data (such as the state-of-the-environment data, pollution loads or concentrations, statistics, etc.). These data are mostly covered by the INSPIRE Directive and the spatial object types and properties defined in the INSPIRE Implementing Rules on data interoperability. Yet, there is flexibility to the extent this data has to be part of type 1. Where data is not covered by the types and properties in the INSPIRE Implementing Rules they should be considered outside a discussion on what are the minimum requirements under INSPIRE. In some cases, extensions of the INSPIRE core data models have been developed as part of the data specifications Technical Guidelines or by thematic communities, to cover additional thematic data. However, since such additional thematic properties of spatial objects types are not explicitly required to be harmonised under the current INSPIRE rules, more flexibility is possible when defining reporting specifications, and other approaches for combining INSPIRE data with additional thematic data can be adopted as well (e.g. a linking approach).

When it comes to the distinction between type 1 and type 2, there is still clarification needed related to the re-use of data elements across reporting obligation and to which degree those data elements qualify for type 1 data. It is suggested to discuss and agree the final distinction by reporting data flow applying above mentioned. This can be interpreted as the environmental data which is not part of the minimum of compliant INSPIRE implementation which can be expected from the Member States.

The **textual and contextual data** (type 3) linked to a certain reference point (such as the air quality plans and programmes, the river basin or waste management plans, the permits, the exemptions or the methodologies used for monitoring, etc.). These data are not addressed by INSPIRE data specifications but are typically covered by reporting obligations under the various environmental directives.

To design successful and efficient eReporting, these three types of data have to be identified and marked. This still has to be accomplished for all current eReporting schemas. Only then, they can be linked and managed together, hence this approach is referred to as the "linked approach". As regards the use of INSPIRE specifications, the strength of the Directive clearly lies with geospatial reference data (or type 1 data) which are most of the data themes listed in the annexes of the INSPIRE Directive. The

²⁰ <https://ies-svn.jrc.ec.europa.eu/documents/58>

list of priority data sets includes the most important spatial data sets for the purpose of reporting (see enclosed). Hence, the eReporting developments using INSPIRE should focus first and foremost on these type 1 data without forgetting the link to the others.

To develop the eReporting approach further, distinction between the EU level and Member State level alongside the present five main data processing steps (see above, page 6/7) may also be meaningful.

At Member State level, the following activities (for the purpose of eReporting) are suggested:

- **MS Activity 1:** Type 1 data as well as the list of priority datasets (see footnote 2) should be made available "as is" **ideally having metadata and services in place**. On a voluntary basis, also type 2 data can be provided alike.
- **MS Activity 2:** Type 1 data as well as the list of priority datasets **are transformed into interoperable data models** (after having validated and described the (extended) data model which is absolutely essential for eReporting. It is likely that in some areas this is different (less complex/ambitious) particularly for the use case of eReporting than the current interoperability rules in the IR 1089/2010 and subsequent amendments²¹ and hence the legal and other implications need to be looked at as well.
- **MS Activity 3:** The Type 2 and 3 data are linked to the core datasets through common elements defined at EU level (e.g. schema elements set in the Reporting Guidance on the Water Framework Directive) so that they can be found either in Reportnet or in national web services.

A national environmental information portal may provide additional information (which often exist already in form of geoportals or environmental portals, see examples in SWD(2016)188)) and can be put in place or enhanced with the different INSPIRE services in place and the facility to find type 2 and type 3 data through the geospatial references (which also would allow for a decentralised approach). Some guidance on good practices for such portals may need to be developed at EU level in collaboration with those who have established them already.

For an interim phase, many Member States will prepare reporting datasets by linking the services and transforming their data into the data format requested by the EU/EEA and depositing it in the CDR.

At EU level, the following activities (for the purpose of eReporting) are suggested:

- **EU activity 1:** Identify and prioritise minimum reference datasets (type 1 or core) which have to fulfil INSPIRE specifications (see above). A first version of such an overall list of most important type 1 datasets is now available (see footnote 2) and will be reviewed and updated on a regular basis. To clarify the interoperability requirements for these datasets a rolling work programme (see below, section 6) would have to be established in line with the reporting deadlines since not all datasets can be developed at the same time.
- **EU activity 2:** a solution is put in place to harvest all – type 1, 2 and – where available and needed – type 3 data sets from those MS which are ready to implement the "linked approach", considering QA/QC processes. Furthermore a solution has to be prepared to consume web services or alternative solutions need to be developed. This approach (which can also be driven by the results of the Reporting Fitness Check) should also enhance consistency and streamline approaches across policy areas.

²¹ <http://inspire.ec.europa.eu/Legislation/Data-Specifications/2892>

- **EU activity 3:** Building on action 1, the EU reference datasets (type 1) compiled at EU level from MS submissions are linked **through common elements defined in a joint process with Member States at EU level** (see above) with the most relevant type 2 and 3 datasets stemming from legal reporting and other sources (e.g. Eionet, ESTAT).
- EU activity 4: EEA integrates type 2 and type 3 datasets to produce indicators etc., as needed, and as is the case already now.

It has to be noted that the link of EU reference datasets (type 1) and relevant type 2 and 3 datasets stemming from legal reporting and other sources can be done in different ways. If there is no definition of common elements on EU level, Member States will find several not comparable solutions for these linkages. Therefore the definition of common elements on EU level should be done at a very early stage.

In parallel to the above, actions in relation to end-user application - which are considered as essential post-eReporting activities - will be initiated in the INSPIRE Project Steering Group and with the Member States. In this context, the question of linking national and EU level data should be explored, to start with in some test cases. This work can be initiated as soon as a sufficient number of national datasets are available. To begin with, ways of linking the EU level data with the national ones are explored and implemented. This will look at tools and services that allow harvesting on decentralised national datasets (e.g. the improvement of the EU geoportal could help in this respect). In this context, the role of the EU geoportal should be explored for linking and harvesting datasets. The results in the context of the SIIF²² pilots could contribute to this process. Ideally, this would be developed for all types of data. This exercise should be preceded by a user analysis to invest in such tools and services most needed at EU level.

6. Specific actions for 2017 and beyond

The overall approach is ambitious and can only be put in place across all environmental data and across the EU within a decade or so. Hence, the above mentioned approach needs to be translated into operational actions and tasks which are implemented in the next years. Hence, a stepwise work programme for 2017 and beyond should be laid down here which is, on one hand, fitting under the umbrella of the INSPIRE Maintenance and Implementation Work Programme 2017-2020 which was recently agreed in principle, and which, on the other hand, responds to the follow-up to the Reporting Fitness Check due to be published in spring 2017.

These actions then need to be integrated into the annual Management Plans of the contributing entities (i.e. DG ENV, EEA, JRC and maybe others at EU level). In addition, agreement with Member States through the relevant existing bodies (INSPIRE MIG, EEA Eionet or MB, reporting working groups, ...) will be pursued since it is essential.

The work programme will also be the basis for further work in the INSPIRE Project Steering Group (PSG)²³.

In the broader context it will be also important to integrate these actions actively into the Digital Single Market Strategy and the related eGovernment Action Plan. In particular this would mean that the specific Action 19 of the eGovernment Action Plan would cover the below listed actions for 2017 in order to ensure "accelerating the deployment and take-up of the INSPIRE Directive data infrastructure".

²² Structured Information and Implementation Framework (see urban wastewater pilot: <http://uwwtd.oieau.fr>)

²³ Internal INSPIRE coordination group with representatives from policy units in DG ENV, as well as the coordination team for the INSPIRE Directive in DG ENV, JRC and EEA.

One of the actions already agreed is the review of the INSPIRE monitoring and reporting where the current system is deemed inefficient and steps are already underway to revise the national reporting (under the INSPIRE Directive) with the view to the next reporting cycle due in 2019. In this context, the use of a dashboard has shown promising results and is praised widely. This action should be developed further as an example under the new eReporting approach. Hence, the INSPIRE reporting could be a first test case on this new approach and can serve as an example for others. A detailed timetable of the above mentioned work will need to be agreed within the EU INSPIRE governance bodies (Committee and MIG).

For 2017, the new action on the list of priority datasets for eReporting²⁴ was agreed by the INSPIRE MIG in December 2016. The EEA is also working on this in the concept of the Eionet/NFP group. These groups, together with related thematic expert groups, will test and further develop this concept. Specific work or initial discussion triggered by this concept are already ongoing in the areas of reporting on:

- Industrial emissions
- Water
- Noise
- Nature.

The progress of this work will be presented and discussed later in 2017. The idea is to gradually work through all datasets covered by the priority list to apply and specify the concept and find pragmatic solutions beneficial for eReporting and INSPIRE implementation at the same time. Additional actions for 2018 to 2020 would have to be further refined and agreed before the end of 2017. However, they would logically follow from the first set of actions as outlined above.

7. Conclusions and next steps

This concept paper on the future of eReporting sets out the current situation and the envisaged direction on how to better use the approaches set out in the INSPIRE Directive for the purpose of electronic reporting for EU environmental legislation. It describes a pragmatic and stepwise approach which allows Member States to prioritise their actions under the INSPIRE Directive and frames actions of the EU level actors in particular Commission's DG Environment and the European Environment Agency.

This paper has been consulted widely and refined as appropriate in order to create a common understanding and a consensual way forward between those experts working on the implementation of the INSPIRE Directive and those involved in reporting of over 50 pieces of environment legislation (see footnote 2).

Whilst the immediate actions resulting from this concept paper will be started in 2017 and gradually developed for the period until 2020, a more long term conceptual discussion and approach needs to be formulated which may fundamentally change the paradigm of reporting from being mostly a central data submission ("push" process) to a decentralised availability of data which can be used for multiple purposes ("pull" process). This will have to be complemented by other conceptual issues important to eReporting which also go beyond the INSPIRE related issues. As a follow up to the Reporting Fitness Check, DG ENV and the EEA are considering of preparing a wider, more long-term conceptual paper on "eReporting, active dissemination and the link to INSPIRE – towards a paradigm shift over the next decade" building on this concept note.

²⁴ See details for action 2016.5 at <https://ies-svn.jrc.ec.europa.eu/issues/2909>

In this context, the EU level institutions will have to work closely together with the technological frontrunners in the Member States in order to develop and implement a modern, ambitious and effective EU environmental reporting infrastructure. Early and timely adopters of the paradigm change will need to be encouraged by the EU level and be provided with an operation solution for the new eReporting in time. Such early adopters or frontrunners should have real benefits from such an approach. Moreover, sufficient investment and transitional planning to allow transforming the current business processes for reporting to new, digital process of harvesting environmental data from Member States will be needed in particular for those Member States lagging behind in the implementation of INSPIRE.

The Fitness Check for Environmental Monitoring and Reporting and the upcoming EEA evaluation are an opportunity to raise these issues and to develop a more long term and ambitious transformation process. Until then, this concept paper can help make useful and beneficial first steps in this direction making INSPIRE implementation and the eReporting processes more effective and efficient for Member States and the EU level actors.