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**REPORT FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN
PARLIAMENT**

**on the implementation of Directive 2007/2/EC of March 2007 establishing an
Infrastructure for Spatial Information in the European Community (INSPIRE)
pursuant to article 23**

{SWD(2016) 243 final}

1. Introduction

Environmental problems do not stop at borders. Solving them often requires cooperation between countries, which is more successful when it is easy to share data across borders and organisations. There are benefits associated with the effective and efficient collection and sharing of data linked to a particular location (spatial data). Besides facilitating better environmental management, this can create synergies with the EU's Digital Single Market¹ strategy, such as developing innovative new products and services that create high-quality jobs and improve European competitiveness.

The Directive establishing an Infrastructure for Spatial Information in the European Community (the INSPIRE Directive)² supports the application of knowledge-based policies and monitoring of activities that have an environmental impact. It sets out actions to remove obstacles to the sharing of spatial data between all levels of government within and across Member States.

The Commission included the INSPIRE Directive in its Regulatory Fitness and Performance Programme (REFIT)³ in 2013 to assess whether this instrument remains fit for purpose at the halfway mark of its implementation. This report presents the implementation progress⁴ and summarises the results of the evaluation.

2. Background

Before 2007,⁵ spatial data was difficult to find online at national and EU level, and were often poorly documented.⁶ They were often kept in incompatible formats, making it difficult to combine different spatial datasets. Many public authorities did not have online services in place enabling people to discover, access, use and share their spatial data (within countries and across borders). There was therefore no EU spatial data infrastructure, meaning that, for example, data on cross-border rivers did not link up.

¹ [COM\(2015\) 192](#)

² 2007/2/EC.

³ SWD(2013)401

⁴ As required by Article 23 of Directive 2007/2/EC.

⁵ As documented in the [Impact Assessment](#).

⁶ i.e. through metadata which provide information on one or more aspects of the spatial data.

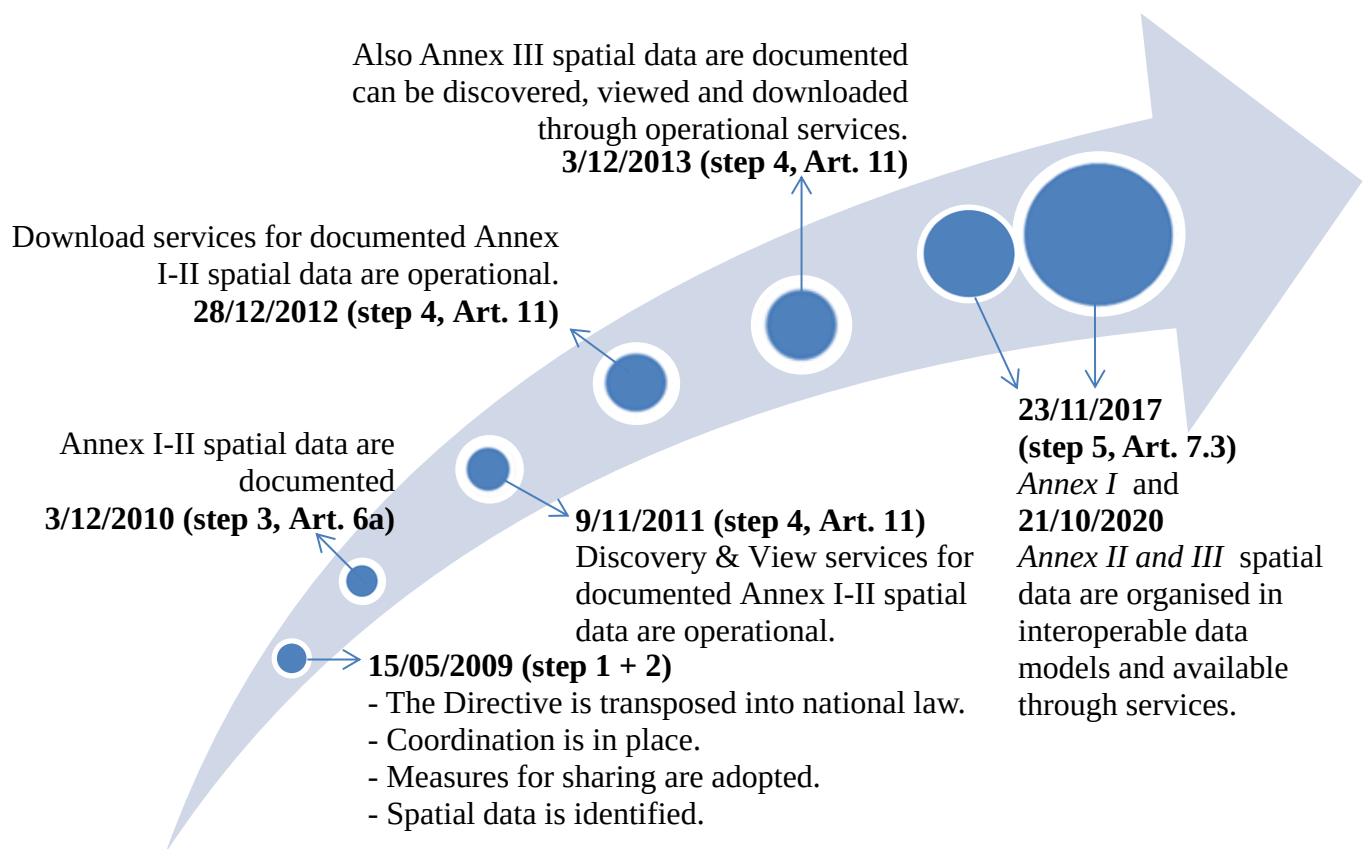


Figure 1: INSPIRE implementation roadmap⁷ – major milestones

To address this situation, the Directive, which is underpinned by several implementing rules (e.g. on reporting or metadata)⁸, requires Member States to (see Figure 1):

- (1) set up coordination structures and adopt and implement legal measures to remove procedural obstacles to the sharing of spatial data;
- (2) identify their spatial data relevant to environmental policies and policies and actions with an environmental impact according to themes listed in the annexes⁹ of the Directive;
- (3) document the spatial data so that they can be accessed on the internet together with information on aspects such as their source, geographical coverage, quality and conditions of use, in line with the metadata specifications¹⁰;
- (4) implement interoperable online services allowing the discovery, visualisation and download of spatial data;

⁷ <http://inspire.ec.europa.eu/index.cfm/pageid/44>

⁸ <http://inspire.ec.europa.eu/index.cfm/pageid/3>

⁹ The Directive's three annexes cover 34 spatial data themes. Annex I contains basic data themes, e.g. coordinate reference systems, addresses, cadastral parcels and transport networks; Annex II has geographic data themes, e.g. elevation and land cover; Annex III covers environmental, health and energy data themes e.g. monitoring facilities, industrial, agricultural or aquaculture facilities, natural risk zones, habitats or energy resources.

¹⁰ [Commission Regulation \(EC\) No 1205/2008](#)

- (5) gradually organise and publish the spatial data according to common data models¹¹ for greater interoperability and improved productivity.

The Directive covers an enormous number of potential spatial datasets and, from the outset, no upper limit or total number could be identified. The Directive needs to be fully implemented by 2021⁷. This evaluation is based on information available at the mid-way point of implementation (i.e. 2013/14).

3. Implementation

Transposition

The Directive had to be transposed by 15 May 2009 but significant political, legal and administrative delays meant that most Member States missed the deadline, with only Denmark transposing it on time. The average delay in communicating the national legislation was 12 months — ranging from 3 - 24 months¹².

The Commission pursued Member States for failing to transpose the directive in a fully compliant manner, and in 2016 is still addressing outstanding transposition issues in nine Member States (CZ, DE, FI, FR, HR, LT, PL, PT, UK).

The outstanding issues on conformity concern minor detailed, legal or technical issues, and do not prevent the Member States concerned from implementing the Directive.

The main reasons for the delays relate to several issues, including political determination, administrative delays and changes in government.

Implementing steps¹³

Although progress has been made in implementing the Directive by 2014, none of the deadlines listed in Figure 1 have been met by all Member States. The linkages between the different steps mean that this has a cumulative impact as, even where progress at a later step is good, it affects a smaller than expected number of spatial datasets. The various steps are detailed below.

Step 1 — Creating coordination structures and data policies for sharing between public authorities

The Directive covers a broad range of spatial data which is managed by a large number of public authorities at national, regional and local level. The necessary coordination structures and data-sharing policies were generally put in place with the transposition (see above).

However, the effectiveness of national coordination efforts varied. Of particular concern were issues in some Member States affecting the collaboration between national mapping agencies and the environment information bodies (e.g. ministries and agencies).

¹¹ In accordance with Commission Regulation (EU) No 1089/2010 as last amended by Regulation (EU) No 1312/2014.

¹² See also chapter 4.1 in the Mid-term evaluation report on INSPIRE implementation — Joint EEA-JRC report (as [EEA Technical report No 17/2014](#)).

¹³ Note: all data are based on the national reports from May 2013 or the annual state-of play reports latest in 2014. Member States have made progress since then and are required to update the situation in their 2016 reports.

The national data policies for sharing data are very variable and heterogeneous and most Member States still report problems in this area. Reflecting the wide flexibility of approaches provided in the Directive (see Article 17.2), policies range from fully open and free access and use, to full cost recovery, raising revenue and various types of public-private partnerships. The Commission has not made a detailed assessment of the conformity of national policies with the Directive.

Step 2 — Progress in identifying the required spatial data

All digital spatial datasets falling under the 34 spatial data themes should have been identified, documented and made available online through services by December 2013.

While it is difficult to benchmark success given the difficulties in identifying an upper limit or total number of datasets falling within scope by 2014, the total number of datasets exceeded 56 220 (Figure 2). Approximately 90 % of these however relate to the datasets of just eight Member States. Following an initial surge, the volume of reported spatial datasets for the remaining (20) Member States remained relatively stable or even declined¹⁴ in some countries between 2010 and 2014 (Figure 2), and were generally rather low at less than 120 datasets per country.

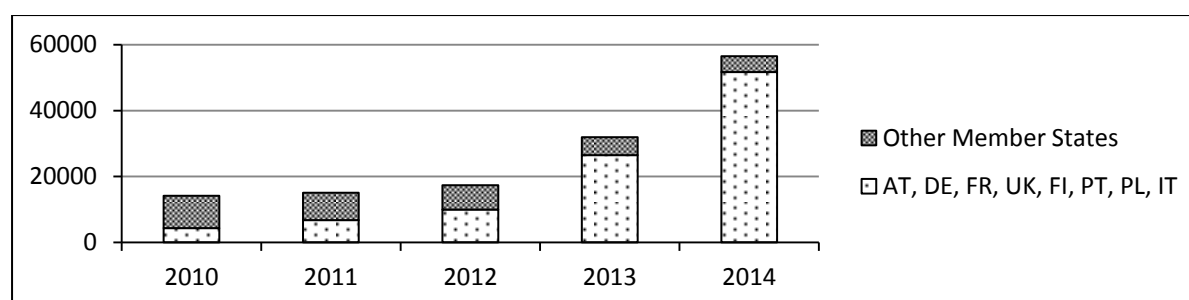


Figure 2: Total volume of spatial datasets (all annexes) reported by Member States

In line with the deadlines and steps identified above, Member States made progress in providing environmental data themes such as the location of and data on sources of emissions. However, the most environmentally relevant data (mostly covered by Annex III) are often not yet accessible (steps 2, 3 and 4, deadline 2013). This will also make the next step of making these data interoperable (step 5, deadline 2020) more difficult.

Step 3 — Documentation of spatial data (metadata)

Documenting identified spatial data enables them to be found online more easily. Although the number of documented spatial datasets has grown steadily, in 2013 only 12 Member States had over 80 % of their documentation in conformity, against a target of 100 % for all Member States (Figure 4).

¹⁴ A decline of data may reflect situations where countries have consolidated many dispersed data sets into one (or few) national datasets. This could then be beneficial for the implementation.

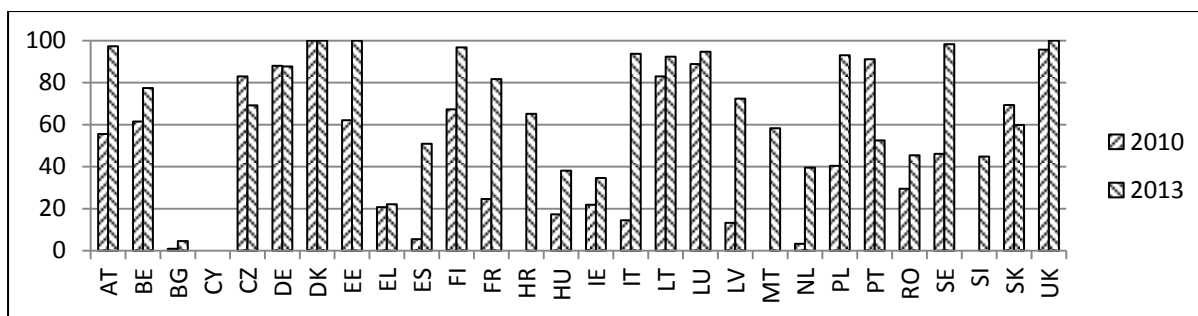


Figure 4: 2010-2013 trends — % of spatial datasets with conforming metadata

Step 4 — Creation of internet services providing access to view and download spatial data

By December 2013, Member States also needed to have online services for discovery, view and download in place for all of their documented spatial datasets.

Progress in this step has been better, with 15 Member States providing discovery services for 80 to 100 % of their documented spatial datasets by the deadline (Figure 5).

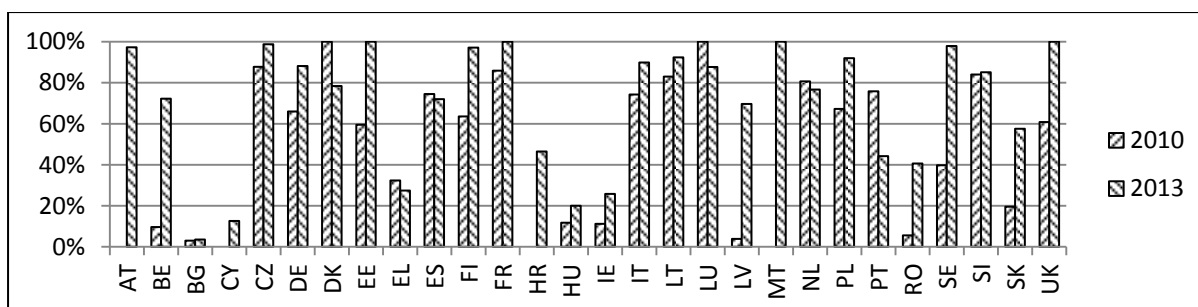


Figure 5: 2010-2013 trends — % of spatial datasets with discovery services

The overall accessibility of spatial datasets through view and download services is even lower, with only about half of Member States publishing 60 to 100 % of their reported spatial datasets through view services (Figure 6).

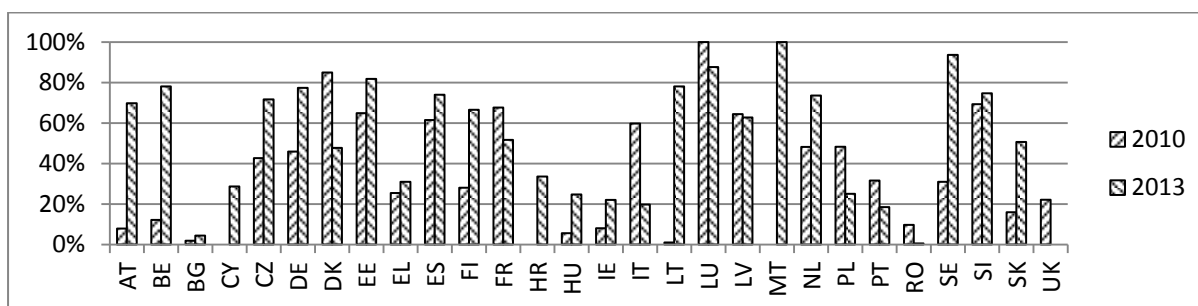


Figure 6: 2010-2013 trends — % of spatial datasets with view services

The situation for download services is also below expectations, with only about a quarter of Member States having 60 to a 100 % of their reported spatial data accessible for download (Figure 7).

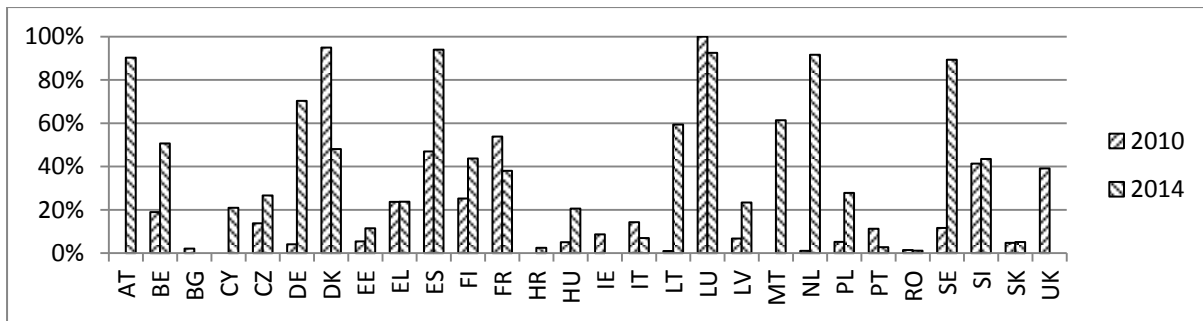


Figure 7: 2010-2013 trends — % of spatial datasets with download services

Step 5 — Availability of spatial data in common data models

Transforming spatial data to conform to common data models is the most challenging task. Member States have until 2020 at the latest to complete this step. At this early implementation stage, the low conformity level of spatial data is not surprising (Figure 8).

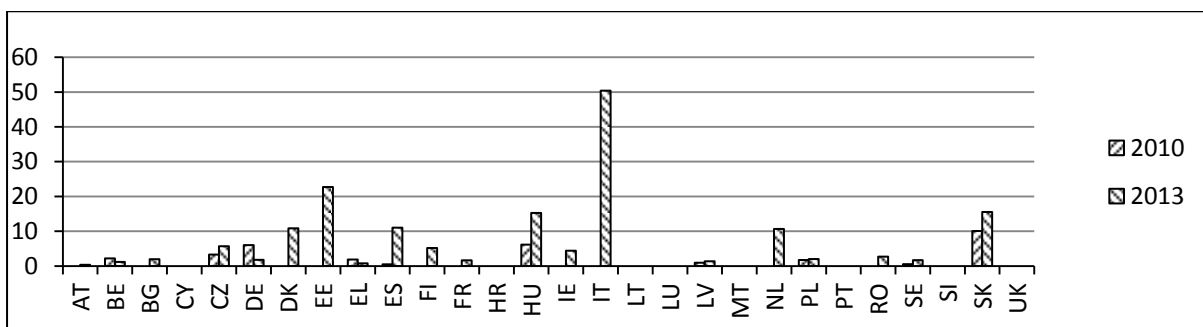


Figure 8: 2010-2013 trends — % of spatial datasets conforming according to common data models — mandatory by 2017 onwards (all annexes)

4. Regulatory fitness

This section provides a summary of the evaluation. More details are available in the related staff working document.¹⁵

Effectiveness

Before the Directive took effect, only a limited number of spatial datasets (1 384 identified in 2007¹⁶) were documented, online services covered only a small fraction of the identified spatial datasets and data policies presented considerable obstacles to their widespread use.

By 2013, effectiveness had increased across all Member States depending on their implementation efforts (and investment), as is illustrated by the over 56 000 datasets reported for 2013. The requirements and timelines of the Directive did not pose fundamental problems for the eight Member States that identified over 90 % of the total datasets¹⁷. For many Member States however, progress against the defined steps and timetable has not met expectations. Complex and heterogeneous national data policies and the absence of a pan-European data policy hinder the free flow of data — a concern also recognised in the wider Digital Single Market. The least effective part of the implementation process relates to data policies. Many datasets and services are still not easily accessible (i.e. without legal or

¹⁵ SWD(2016) 243

¹⁶ [Spatial Data Infrastructures in Europe: State of Play 2007](#)

¹⁷ The conformity of the national legislation is still under discussion in some of these Member States, but this did not affect their ability to implement the Directive well (see section 3 on ‘transposition’).

financial barriers), which is a prerequisite for creating added value from these data in the internal market. These complex and diverse data policies also create an additional, unnecessary administrative burden compared with a broader open data policy.

Other reasons for the implementation gaps:

- Delays in transposing and setting up effective administrative structures due to political, legal and economic challenges at national level (see section 3, step 1). Several Member States reported that the economic crisis and pressure on national budgets also had an impact on the allocation of required, up-front investment (e.g. in IT infrastructure and technical skills development in administrations);
- Insufficient coordination, clarification and priority setting between relevant authorities at national level, in particular those responsible for environmental data (e.g. identifying minimum required datasets);
- Inefficient EU-level coordination (the European Commission and EEA) in guiding Member States towards priorities in identifying the spatial datasets for environmental and related policies (e.g. for reporting);
- An ambitious set of deadlines which was valid when the Directive was adopted may not be pertinent anymore for all Member States, e.g. due to the technical complexity of the interoperability implementing rules and guidelines that require the application of IT tools and skills that are often absent. Added to this are the different levels of preparedness of Member States with regard to meeting the deadlines set by the Directive.

Some of the less advanced Member States also reported competition with parallel national policies on open data and eGovernment for administrative reasons (different competent authorities), and the low relevance of environmental issues in a wider policy context. Others (including some of the more advanced) demonstrated that competition is unnecessary — there is ample scope for creating ‘win-win’ approaches where INSPIRE becomes a building block for eGovernment activities.

Member States also questioned the effectiveness of future data harmonisation (step 5) due to the significant effort and cost involved in transforming existing datasets to meet the new requirements (deadlines in 2017 and 2020). Many acknowledged that greater interoperability is needed to achieve efficiency gains. They also expressed concern regarding the complexity and the feasibility of adapting all spatial data to common data models by 2017 (Annex I) or 2020 (Annex II and III). They called for a flexible, pragmatic and user-driven application of the existing data specifications.

Efficiency

The quantitative evaluation of costs and benefits was difficult to do due to a lack of comprehensive and comparable data. Given the stage of implementation, most of the currently available studies are based on estimates or predictions, and quantified benefits data are scarce.

The reported implementation costs varied from 0.5 to 13.5 million €/year with most Member States reporting between 2 to 3 million €/year. In most cases this is below the original estimates which ranged from 4 to 8 million €/year in the initial impact assessment¹⁸, and is likely to be related to poorer progress than expected.

¹⁸ [Contribution to the extended impact assessment of INSPIRE.](#)

The information provided on benefits, which was mainly qualitative and based on estimates, included the following points:

- More efficient access to information¹⁹ leading to better and cheaper eGovernment services for citizens and businesses, thus improving transparency and creating business opportunities using environmental data. This boosts research and innovation potential.
- An improved evidence base for policy development, decision-making and implementation, reducing costs and improving the quality of assessments (e.g. in the area of environmental (impact) assessments and (risk) management)²⁰.
- Better cooperation between public authorities and between different sectors (e.g. spatial planning, transport, agriculture and environment)²¹, and administrative cost savings (through less duplication of work) while improving accessibility and data quality.
- Building up technological skills, competences and capacity building in public administrations.

Several countries including the Netherlands appear to have followed a fairly predictable pattern, with annual costs exceeding the benefits in the beginning, but benefits increasing in the second phase of implementation (after 2013). While early investment (in IT infrastructure, transformation of data and skills development) was expected, only a few Member States reported that they had made this investment. Several Member States reported synergies²² between the EU and national strategies on Open Data²³ (including the revised Directive on the re-use of public sector information)²⁴ which had helped to increase the benefits while sharing the implementation costs with the investment needed anyhow for the broader open data policies. The 2012 UK Benefits Realisation Strategy²⁵ estimated that annual quantifiable benefits across UK government departments were 470-510 million £/year.

As mentioned under step 5, data harmonisation is the most costly and challenging step. Although Member States have to comply with these provisions only by 2017 or 2020 (depending on the data concerned), in recent expert group discussions²⁶ they foresaw that simultaneously harmonising such an enormous amount of data would involve high costs and practical difficulties. It was suggested that one way to overcome this future challenge is to set clear priorities, i.e. to identify the most important datasets for end-user applications amongst the data themes, in particular those of Annex III.

¹⁹ [The Basic Data Programme — A Danish Infrastructure Model for Public Data](#), 2014.

²⁰ E.g. in relation to environmental impact assessments carried out of EU legislation, a study indicated potential savings of 15 % in time and some 150 m €/year in costs at EU level (JRC Technical Report — [EUR24327 EN — 2010](#)).

²¹ E.g. the Land Parcel Information System in Romania used the INSPIRE Directive to manage agricultural subsidies and identify environmental improvements. Other Member States reported similar projects.

²² For example: [57 % of INSPIRE data is OPEN in Finland and served through INSPIRE services](#) or [INSPIRE and Open data](#); Ashfield District Council in the UK publishes data under the European INSPIRE Directive and as Open Data.

²³ [COM\(2011\) 882](#)

²⁴ [2013/37/EU](#)

²⁶ As discussed at the [INSPIRE Maintenance and Implementation Expert Group](#) in December 2015.

EU funding has been able to mitigate some of these issues and several projects have been supported by EU programmes (e.g. ISA²⁷, Horizon 2020, LIFE+). Such projects²⁸ can help to develop solutions and tools that can be used by all Member States (reusable components), which can improve efficiency across multiple policy sectors. However, these opportunities are not used systematically by Member States.

Relevance

The public consultation²⁹ demonstrated substantial support for the objectives of the Directive, considering them still relevant for removing the obstacles to data sharing that hamper effective and efficient implementation of environmental policy. Moreover, EU policy developments show that the objectives of the INSPIRE Directive have become increasingly relevant over time, and are included in Commission priorities relating to the 2015 EU Digital Single Market strategy. It identified the need to increase cross-sector interoperability in the public sector (with the revision of the European Interoperability Framework) where INSPIRE is of major relevance. Promoting eGovernment services and the need to apply the ‘digital by default’ and ‘use once’ principles are all enshrined in the INSPIRE Directive.

The 7th Environment Action Programme has reiterated the need to improve the evidence base for environment policy. Moreover, the application of the INSPIRE Directive is potentially important for achieving the aims of the on-going Fitness Check³⁰ for environmental monitoring and reporting being carried out as part of the Better Regulation agenda.³¹

Coherence

The internal coherence of the Directive has proven to be sound because Member States largely follow its steps.

In relation to other environmental legislation, the Directive aims to contribute to cross-border and EU legal and technical interoperability. However, progress in adapting data management in the environmental field has only been partial. While reference to the INSPIRE Directive became commonplace after 2007, its practical application is only just starting e.g. in the field of reporting.

The consistent application of INSPIRE rules in conjunction with the Public Access to Environmental Information Directive³², in particular the active dissemination provisions (see Article 7), provide the potential to facilitate data sharing and better inform and empower citizens.

In relation to the broader set of EU policies, the INSPIRE Directive is generally consistent with the objectives of the European Interoperability Framework and the broader objectives of the EU Digital Single Market. Moreover, links have been established to the new initiatives of the European Open Science Cloud and the European Data Infrastructure, under the ‘European Cloud initiative’³³ and the eGovernment Action Plan³⁴. Specific issues that may need

²⁷ [Interoperability Solutions for European Public Administrations](#)

²⁸ Examples include: the European Union Location Framework (EULF) and Reusable INSPIRE Reference Platform (ARE3NA), [the European Geological Data Infrastructure, EGDI](#), [Scotland’s Environment Web](#) .

²⁹ 94 % agree — 1 % disagree — 5 % no opinion: page 28 [Summary Report INSPIRE Public Consultation 2013](#).

³⁰ See [Roadmap](#)

³¹ See Commission Work Programme 2016 (COM(2015) 610, Annex 2)

³² [Directive 2003/4/EC](#)

³³ COM(2016) 178

attention include consistency of access to data policies, also set out the Public Sector Information Directive. This relates to broader issues on the free flow of data, identified as a priority issue for the Digital Single Market.

EU added value

Given the timing of this report in the INSPIRE implementation process, analysing the EU added value actually delivered is not possible. The potential improvements in EU and cross-border spatial data management offered by the INSPIRE Directive remain significant, not just in the environmental field. Whether it is sharing data on air quality or flood risk management, environmental solutions often need cross-border collaboration. While this is not yet consistently provided, there is evidence that issues arising from (earlier and current) different national approaches prevent this happening. A number of uses for data covered by the INSPIRE Directive can be further exploited at EU level through reporting, supporting impact assessments or evaluations, research and innovation. In particular the chance to exploit the potential of data received through the Copernicus programme is important since these remote sensing data often need to be combined with spatial data to add value and context.

There are currently few end-user applications³⁵ that allow harvesting the potential of data using the INSPIRE approach at EU level. On reporting, some pilot projects have been completed, such as the air quality reporting pilot, but none has reached full operational maturity. National priority setting differs greatly in terms of identifying those spatial datasets most needed for cross-border applications or for reporting activities at EU level (i.e. some focus on air quality³⁶, others on marine data³⁷). Finally, collaboration between the Commission and Member States has generally been seen as positive but can be strengthened further by, for example, developing implementing tools and components together rather than each Member State ‘reinventing the wheel’.

5. Conclusions

The evaluation of the INSPIRE Directive confirms that the overall relevance of the Directive to meeting policy needs in an efficient manner remains high, and is expected to increase with time, given the drive towards a digital economy as set out by the Digital Single Market strategy which includes important elements of the Directive.

Good progress in implementation been made in only the few Member States where the necessary investments were made and implementation of the Directive was aligned with wider national action on open data policies and better eGovernment services. The implementation gaps identified are significant and result from accumulated delays in the process, underlining the differences in speed and quality of implementation.

As a result, overall effectiveness has suffered. In particular, the significant remaining obstacles created by the data policies in many countries impede effective progress and perpetuate the administrative burden because data cannot be easily shared between administrations. Nonetheless, some Member States have shown that the process is possible and report positively on the resultant benefits, if only in qualitative terms.

³⁴ See action 19 in COM(2016) 179

³⁵ E.g. the [Information Platform for Chemical Monitoring](#) using basic INSPIRE features to access a multitude of data sources. For other examples, see footnote 28.

³⁶ [Geodateninfrastruktur Deutschland: INSPIRE success story — Implementing e-reporting of air quality based on INSPIRE at national level.](#)

³⁷ [The German Marine Data Infrastructure and the Marine Strategy Framework Directive](#), 2015

This is confirmed by the evaluation of efficiency from front-runner Member States that invested in implementation early on, developed more open data policies and aligned the INSPIRE Directive with their national priorities on open data and the drive for eGovernment. Upfront costs however are higher than benefits since data will have to be made available in the required ways first before being used for end-user applications. Many Member States made insufficient investments, probably because of the economic crisis.

The evaluation of coherence has uncovered areas needing attention, in particular the development of the data policies creating obstacles in the internal (digital) market which is also of relevance to the ‘free flow of data’ initiative.

Finally, future EU added value can be significant. Addressing the above-mentioned issues and focusing on end-user needs and applications in a cross-border and EU context can assist implementation and help prioritise resources and investments.

6. Recommendations and next steps

Based on the evaluation results, it is clear that greater effort at all levels by all actors is needed in the future. To this end, the Commission proposes a number of actions for both Member States and at EU level.

As a prerequisite, all Member States need to step up their efforts in implementing (e.g. on their coordination activities) and critically reviewing the effectiveness of their data policies. This applies in particular to those Member States lagging behind the most if they are to meet future implementation deadlines. In addition, Member States, in consultation with the Commission, are recommended to:

- 1) give priority to environmental spatial³⁸ datasets, in particular those linked to monitoring and reporting, and those identified in relevant global processes.³⁹
- 2) improve coordination between the national INSPIRE implementation and eGovernment, open data and other relevant processes at national level.

To complement national efforts, the Commission will:

- A. evaluate the shortcomings of the national data policies in relation to Article 17 of the Directive in more detail and explore synergies with the ‘free flow of data’ initiative⁴⁰ under the Digital Single Market with the view to resolving these issues through that;
- B. review, and possibly revise, the INSPIRE rules⁴¹, in particular on spatial data harmonisation, to take into account the implementing risks and complexities with a view to reducing them (simplifying requirements);
- C. assist the Member States in applying and implementing the INSPIRE Directive (simplification of use), e.g. by the use of common tools, and promote priority setting together with the Member States.
- D. work closely with Member States to explore opportunities arising from the use of existing EU-level funding programmes to help capacity building and close the

³⁸ and make them at least accessible ‘as is’ to other public authorities and the public through digital services in line with the INSPIRE Directive.

³⁹ E.g. in the context of the Copernicus programme, the Global Geospatial Information Management (UN-GGIM) and the Group on Earth Observation.

⁴⁰ See [Inception Impact Assessment of Free Flow of Data Initiative](#)

⁴¹ See section 2 and footnote 8

INSPIRE implementation gaps (e.g. through the Interoperability Solutions Administrations).

Other actions in the context of the Digital Single Market will also contribute to implementing the INSPIRE Directive (e.g. the eGovernment Action Plan and the European Interoperability Framework). The Commission together with the Member States will also promote the inclusion of INSPIRE services and data harmonisation in relevant EU initiatives (e.g. Copernicus, Horizon 2020), Commission departments, European agencies and international partners to the EU.

These and other relevant actions will be discussed between the Commission departments, assisted by the European Environment Agency and the Member States in the context of the ongoing INSPIRE Maintenance and Implementation Framework⁴² following the adoption of this report.

⁴² [INSPIRE Maintenance and Implementation Framework \(MIF\)](#)