INSPIRE

Infrastructure for Spatial Information in Europe

Work Programme for the implementation and evolution of the INSPIRE Directive for the period from 2020 – 2024 (WP 2020)

Working title: "Towards a Common European Green Deal data space for environment and sustainability"

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Conclusions:

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[1] MIG and MIG-T are the official MS expert groups that are mandated to support the implementation of the INSPIRE Directive. The MIG-T is the technical group and the MIG is the policy group that ultimately decides on the work programme.

Work Programme for the implementation and evolution of the INSPIRE Directive for the period from 2020 – 2024 (WP 2020)

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Disclaimer:

This document is a joint, consensual and voluntary work programme endorsed by experts of the EU Member States, the European Commission (DG ENV, DG JRC, and DG ESTAT), the European Environment Agency and experts from other countries (in particular Norway and Iceland) for the INSPIRE Directive. It is a commitment to work together at EU level to close existing implementation gaps and reap the benefits of the INSPIRE Directive and complements positively (not replaces) all the significant national efforts and strategies. This document does not alter in any way the legal obligations set out by the Directive.

The document aims at framing and mandating the work in the MIG from 2020 onwards. This document will be reviewed, and if necessary revised by the MIG on a regular basis.

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1 Background and context

The overall objective of Directive 2007/2/EC (INSPIRE) is to establish a European spatial data infrastructure for the purposes of EU's environmental policies and policies or activities which have an impact on the environment (Article 1 of INSPIRE Directive 2007/2/EC). This will enable the better sharing of environmental spatial information among public sector organisations and better facilitate public access to spatial information across Europe which will benefit citizens and businesses alike. With only two implementation deadlines remaining (interoperability for Annex II and III spatial data sets – 21/10/2020, interoperability for invocable spatial data services – 10/12/2021) the implementation of the INSPIRE Directive has entered the last mile.

In 2016 the Commission concluded the mid-term evaluation and REFIT[2] of Directive 2007/2/EC (INSPIRE). This evaluation of the INSPIRE Directive confirmed that the overall relevance of the Directive to meeting policy needs in an efficient manner remains high, and was expected to increase with time, given the drive towards a digital economy which includes important elements of the Directive. Good progress in implementation was made in only the few Member States where the necessary investments were made and the implementation of the Directive was aligned with wider national action on open data policies and eGovernment services. The implementation gaps identified were significant and resulted from accumulated delays in the process, underlining the differences in speed and quality of implementation. As a result, the overall effectiveness has suffered. In particular, data policies in many Member States impeded effective progress and created administrative burden because data cannot be easily shared between administrations. A large diversity existed throughout the EU and there was no country which had fully implemented the Directive related to those deadlines that had already expired. The Maintenance and Implementation Work Programme 2016-2020 responded to these findings and the recommendations made by the Commission.

The Commission initiated a number of actions at EU level to improve the implementation and impact of INSPIRE:

- ***Better data access - Evaluate the shortcomings of the national data policies in relation to Article 17 of the Directive in more detail.***

  The Commission has launched a study for the 'Evaluation and assessment of INSPIRE Directive 2007/2/EC data sharing between public authorities and public access and use provisions'. The findings of the study show that additional efforts are needed to further harmonise data policies and licenses for data reuse in the Member States. Other remaining obstacles limiting data sharing are the availability of the data itself, broken links and missing services to provide access to the data. This can be improved by further promoting the use of INSPIRE data in practice and demonstrating the added value. The e-Reporting use case and the list of priority data sets supporting e-reporting are considered good practices to stimulate implementation. Benefits can also be expected from further aligning Article 17 on data sharing of the INSPIRE Directive with the new Directive on Open Data and on the re-use of public sector information. Moreover, the proposed data categories in the foreseen implementing act on High Value Datasets,

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[2] https://inspire.ec.europa.eu/documents/mid-term-evaluation-report-inspire-implementation

defined under the Open Data Directive, have a clear overlap with the data scope of the IN-SPIRE Directive and could benefit from reusing already available spatial data in the INSPIRE infrastructure.

- ***Simplification & flexibility - Review, and possibly revise, the INSPIRE rules, in particular on monitoring, reporting and spatial data harmonisation, to take into account the implementing risks and complexities with a view to reducing them (simplifying requirements).***

Experience from the previous reporting exercises and the conclusions of recent evaluations (REFIT evaluation of Directive 2007/2/EC and the Fitness Check on reporting and monitoring of EU environment policy) have shown the need to simplify and streamline monitoring and reporting, support better comparison of the implementation progress across Member States and allow for National and EU-wide overviews while reducing administrative monitoring and reporting burden. Monitoring and reporting have been aligned and streamlined by simplifying the legal provisions and amending the related Implementing Decision to make it more meaningful and effective. The Proposal on alignment of reporting obligations in the field of environment policy[3] was adopted by the Council on 21 May 2019. The proposal for a review of the reporting Decision[4] was adopted by the INSPIRE Committee on 27 November 2018 and was adopted by the College and published on 23rd August 2019. MS will report under the new regime from 15 December 2019 onwards and the Commission (JRC) has developed a reporting tool which will make the whole monitoring and reporting process much more effective and efficient. Furthermore, the Commission has gathered evidence in 2017-2018 on possible issues/improvements to the INSPIRE framework. The findings have been discussed with Member State experts and the Commission will take the advice from the Member States expert group in consideration in the review of the interoperability regulation. The evidence gathering is now completed and the issues identified are now being translated in to revision of the existing regulation. This will make the application of the data specifications easier, more flexible and less burdensome without losing the benefits of standardisation and interoperability. The intention is to adopt a revised Regulation in 2020.

- ***Prioritization - 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.***

The Commission has selected monitoring and reporting under the environmental acquis as a priority use case for the development of a first set of pan-European information products. Based on the evaluation of reporting obligations under the environmental legislation, a preliminary list of common datasets related to environmental reporting obligations was prepared by the Commission in collaboration with the Member States[5].

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[3]https://ec.europa.eu/info/news/environmental-data-commission-welcomes-council-adoption-new-rules-reduce-red-tape-and-increase-transparency-citizens-2019-may-21

[4] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019D1372&from=EN

[5] https://webgate.ec.europa.eu/fpfis/wikis/x/W4LdEQ

The number of environmental priority datasets in the INSPIRE catalogue made accessible by Member States is slowly but gradually increasing[6]

The progress made by the Member States vis-à-vis the follow-up actions identified in the REFIT is documented in country fiches[7] and a comparative EU overview fiche[8].

The reengineered INSPIRE Geoportal[9], that was released in September 2018, provides an online dashboard that allows for assessing the actual state of implementation in the Member States as well as simplifies substantially the discovery and use of MS data. The first Geoportal Workshop in January 2019 triggered an intensive dialogue with Member State experts about how to improve the availability as well as the usability of their data via the EU Geoportal. The discussion has intensified with the new Commission Decision on Monitoring and Reporting that reduced the number of monitoring indicators, but at the same time introduced new ones (e.g. Priority data sets, national / regional datasets) and requires the indicators to reflect the real status of the data availability in the EU Geoportal.

The definition of the priority list of data sets for eReporting to support environmental reporting and the request to make these data sets available as-is (as-is = metadata available in the EU geoportal and data accessible for download and view), created a clear implementation scope and focus. However, even with such clear directions, many Member States are still having difficulties to identify and make available the requested data sets. Moreover, the findings of the study "Promotion of good practices for national environmental information systems and tools for data harvesting at EU level" and recent discussions with the Member State INSPIRE representatives (MIG, MIG-T) related to data availability and usability revealed some national practices that were not at all anticipated by the INSPIRE Directive. Some Member States are developing a separate Spatial Data Infrastructure (or at least separate data sets and services) specifically to comply with the obligations of the INSPIRE Directive, while at the same time maintaining and even further developing their national Spatial Data Infrastructure. This goes against the philosophy of the INSPIRE Directive where clearly is stated in Article 1(2) that "Inspire shall build upon infrastructures for spatial information established and operated by the Member States". Duplicating national Spatial Data Infrastructures to satisfy INSPIRE obligations creates inefficiencies, unnecessary implementation burden and is not sustainable in the longer term, which limits possible reuse (e.g. new innovative services based directly on the infrastructure).

At the same time, there are a number of recent Commission activities that create high expectations on the usability of the INSPIRE data infrastructure. These include the recent European Data Strategy[10],

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[6] http://inspire-geoportal.ec.europa.eu/pdv_home.html

[7] https://inspire.ec.europa.eu/portfolio/inspire-your-country

[8] https://inspire.ec.europa.eu/documents/summary-report-status-implementation-inspire-directive-eu

[9] http://inspire-geoportal.ec.europa.eu

[10] https://ec.europa.eu/info/sites/info/files/communication-european-strategy-data-19feb2020_en.pdf

the revised Open Data and PSI Directive[11] introducing the concept of High Value Data Sets, the increased demand for spatial data in scope of the INSPIRE Directive from other Commission DGs in various thematic domains (AGRI, GROW, ENER, MOVE, ESTAT)[12], and the Commission-internal initiative to become more data-driven (EC Data Strategy).

Taking all this into account, the Commission invites the Member States to continue the successful collaboration within the Maintenance and Implementation Framework (MIF) which was established following the adoption of the Directive to support the implementation efforts proactively and collaboratively. In operational terms, this would require a new Work Programme 2020-2024 for the INSPIRE Directive (WP).

This document responds to this call and prepares a new WP building on the existing one (MIWP2016-2020[13]). In view of the planned evaluation of the INSPIRE Directive by 2022 and the changing context driven by the political reality, the WP will follow three parallel and closely related strands.

The first strand will develop a future vision for transforming the INSPIRE Directive and its implementation into a digital ecosystem for environment and sustainability that is fully integrated in the Common European Green Deal data space and supports data spaces on mobility/transportation, energy, agriculture and health envisaged in the European Data Strategy. Therefore visions for INSPIRE and the development of data spaces have to go along each other. Based on this vision, the second strand will work on the further evolution of the legal framework beyond 2022 and the development of the European spatial data infrastructure, while the third strand will take the implementation of the INSPIRE Directive across Europe to comparable maturity levels regarding data availability and accessibility by the end of 2021, a common implementation "landing zone" and "bridge" towards the future vision.

It is clear, however, that the WP will have to undergo a regular review and, if necessary, adaptation to the changing situations induced by the outcome of the evaluation of the Directive and the possible review of the legal framework. Therefore, the document sets out the context for the new WP (this section), establishes a strategic direction (section 2), identifies key areas of work (section 3), strengthens the stakeholder engagement (section 4), discusses practical arrangements (section 5), and concludes including provisions for a regular review mechanism (section 6).

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[11] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1561563110433&uri=CELEX:32019L1024

[12] https://ies-svn.jrc.ec.europa.eu/attachments/download/2536/%5BDOC11_rev%5D_Priority%20Geospatial%20Datasets%20for%20the%20European%20Commission.pdf

[13] https://webgate.ec.europa.eu/fpfis/wikis/x/7IRDE

2   Strategic direction towards need driven implementation

The overarching **vision** for a European spatial data infrastructure for the purposes of EU's environmental policies and policies or activities which have an impact on the environment (Article 1 of INSPIRE Directive 2007/2/EC) has not changed since the inception of the Directive, and is to **promote data sharing** and put in place easy-to-use, transparent, **interoperable spatial data services** which are used in the daily work of environmental and other policy makers and policy implementers **across the EU at all levels of governance** as well as businesses, science and citizens.

In June 2019 the Commission organised a **workshop** with the Member States about the **future of the INSPIRE** Directive beyond its implementation scope. Ideas were developed and exchanged on the short term (2022-2024) and the long term (2030) future for the INSPIRE Directive. The workshop resulted in some very clear recommendations for the future development of the Directive:

- New data sources should be included (3D, linked data, IoT data …). It was recommended to go beyond spatial data and to seek synergies with non-spatial data activities.
- The further implementation (data and services availability, accessibility and interoperability) of the Directive should be driven by a real demand and use cases.
- Implementation should speed up. We should do less things, but do them quicker.
- The legal implementation framework should be completely technology neutral and should avoid implementation requirements that lead to specialised software developments. Implementers should have the option to deploy off-the-shelf tools.

More recently, **Commission President von der Leyen** stressed the need for Europe to lead the transition to a healthy planet and a new digital world in her **political guidelines**. This twin challenge of a green and digital transformation has to go hand-in-hand and direct us towards more sustainable solutions which are resource-efficient, circular and climate-neutral. Data is at the centre of this transformation and data-driven innovation will contribute to the implementation of the objectives of the **European Green Deal**[14]. Data access and interoperability, independent from individual domains, are explicitly highlighted as an essential requirement of data driven innovation (chapter 2.2.3) as well as of sustainable risk management to follow climate change effects (chapter 2.1.1). To use the major potential of data in support of the Green Deal priority actions on climate change, circular economy, zero pollution, biodiversity, deforestation and compliance assurance, a Common European Green Deal data space will be developed following the European Data Strategy. DG ENV's centerpiece action to develop this **Green Deal data space** will be the "**GreenData4All**" initiative, which (following an evaluation/impact assessment) will aim to review and possibly revise two pieces of existing legislation:

- The Access to Environment Information Directive (2003/4/EC);
- The INSPIRE Directive (2007/2/EC) dealing with geospatial data for the environment;

Furthermore, developing this Green Deal Data Space goes along with the introduction of data-services for reusable data, setting up a European Data Space for the circular economy, starting a pilot on zero emissions using available data and creating a digital twin of the planet earth (Destination Earth). These activities will promote other data spaces on e.g. mobility/transportation, energy, agriculture and

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[14] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1588580774040&uri=CELEX:52019DC0640

health either. The European Spatial Data Infrastructure – If it is set up, run and further developed in a user-driven way – can become a main support of this development; through its data and its services. Additionally, this process supports the goal of the White Paper on Artificial Intelligence to support development of AI solutions, and therefore the INSPIRE Work programme 2020-24 can become a centerpiece of creating the digital future of Europe.

The overall objective is to ensure that the most modern and innovative technologies are used to deliver on our basic European values of transparency and democracy, help channel the energy from EU citizens to contribute to European Green Deal solutions and minimize administrative burden by using less paper and more digital solutions.

Looking back on the past implementation cycle of the Directive, we can conclude that **a coherent legal framework** for the INSPIRE Directive was put in place. The implementation progress since 2016 is encouraging but what have we really achieved by now? What benefits did this have for the environment, citizens and businesses? **Implementation is still delayed** and gaps are only closing slowly. There is need for more work on data sharing and continued work on increased flexibility. Implementation in Member States still happens at different speeds and levels of engagements. The INSPIRE case is still more convincing in theory than in practice (e.g. limited number of real cases where INSPIRE is used at level of impact assessments or inspection) and we still have to move from a "proof of concept" to a "game changer" across all domains (e.g. difficulties of building demonstrators, availability of quality priority data across EU27 is still low, …). As already indicated by Member State experts on several occasions, there is very little use for parallel INSPIRE spatial data infrastructures on the national level. The lack of interest beyond satisfying the legal obligations in many cases results in little maintenance and updates of these parallel implementations. The resulting heterogeneous implementations and offerings of spatial data across Member States do not provide a useful data repository for EU level applications either.

Based on the emerging policy landscape under the new Commission and the status of the implementation and impact of INSPIRE, the new work programme should focus on the following key strategic objectives without neglecting existing legal obligations :

1. *__Develop a future vision__ for the role of INSPIRE in the Green Deal Data space in particular and the EU Common Data space in general.*

2. *__Define the INSPIRE "crown jewels"__ – those data sets/themes, for which tangible benefits for environment policy, the implementation of the European Green Deal or other political priorities can be expected.*

3. *Develop an implementation plan to __focus implementation efforts to maximise availability, ensure interoperability and reach pan-European spatial coverage__ for this well-defined set of priority data.*

4. *Continue work on __simplifying and mainstreaming the technical requirements__ of the INSPIRE Directive, taking into account emerging standards and technologies to fulfill concret users exspectations.*

5. *Define the __transition from the current legal framework to a digital ecosystem for environment and sustainability__ which addresses clearly defined EU wide needs, is based on*

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proven standards and technologies, can be implemented in a foreseeable time with limited effort, allows to quantify an added value for environment and sustainability and has a built-in review cycle .

These key objectives will be grouped into the following **main areas of work** for the WP 2020-2024:
- **Area of work 1: A digital ecosystem for the environment and sustainability** (objective 1);
- **Area of work 2: Towards a common implementation landing zone** (objectives 2-4);
- **Area of work 3: GreenData4All** (objective 5)

These new strategic directions will guide the WP 2020-2024 and should result in immediate actions to demonstrate that the INSPIRE Directive can be implemented in a proportionate, faster and pragmatic way without opposing legal obligations.

3   Working areas and key activities

Building on the above-mentioned strategic objectives, three areas of work are defined and the overall activities are outlined. The detailed activities and tasks are set out in the Annex 1 (core activities under the areas of work).

3.1   Area of work 1: "A digital ecosystem for the environment and sustainability"

This area of work will define the vision for **a digital ecosystem for environment and sustainability** that is fully integrated in the European Green Deal data space envisaged in the European Data Strategy in support of the EU Green Deal and steer the transition from the current legal framework and its implementation towards this vision (action 2020.1.1). This work area will follow the evolution of the framework for the development of the common European Data space and will feed into the review and possible revision of the INSPIRE legal framework under the "Green Data4All" initiative (see Area of work 3). Consequently, the main set of implementation activities in this area of work will start already in parallel with the other working areas in 2020. It will need to closely follow the cross-cutting requirements for the common European data space (which will be developed by DG CNECT in Q2-Q4/2020) and the other components of the European Green Deal data space: the roll out of re-usable data-services on a large scale, the establishment of a common European data space for smart circular applications, a pilot for early implementation of the data strategy in the context of the 'zero pollution ambition' and the launch of the 'Destination Earth' initiative (digital twin of the planet).

In its Data Strategy, the Commission promotes the development of a common European data space to support the development of a data economy and to increase data use across the EU. This common European data space would be established on two mutually reinforcing pillars:

1. A horizontal data governance framework (the overall *common European data space*), providing a set of rules applicable to different types of data and different contexts of data re-use, consisting of both legislative and non-legislative elements. This framework will inform the second pillar of the strategy, which is the creation of *common European data spaces* at the sectoral level.

2. The common European data spaces are meant to support the aggregation of data from across Europe, both for the public sector and for businesses, and make them available for the development of new products and services, leveraging cloud infrastructures where needed. The notion of common European data spaces includes four dimensions:
   * the necessary IT systems (digital industrial and personal data platforms);
   * domain-specific data governance frameworks as articulations of the overall technical governance framework for data to be established at the EU level;
   * enabling standards, including semantic standards and interoperability protocols – both domain-specific and crosscutting;
   * enabling competitive and seamless access and use of cloud infrastructures and services through the deployment of pan-European cloud federations.
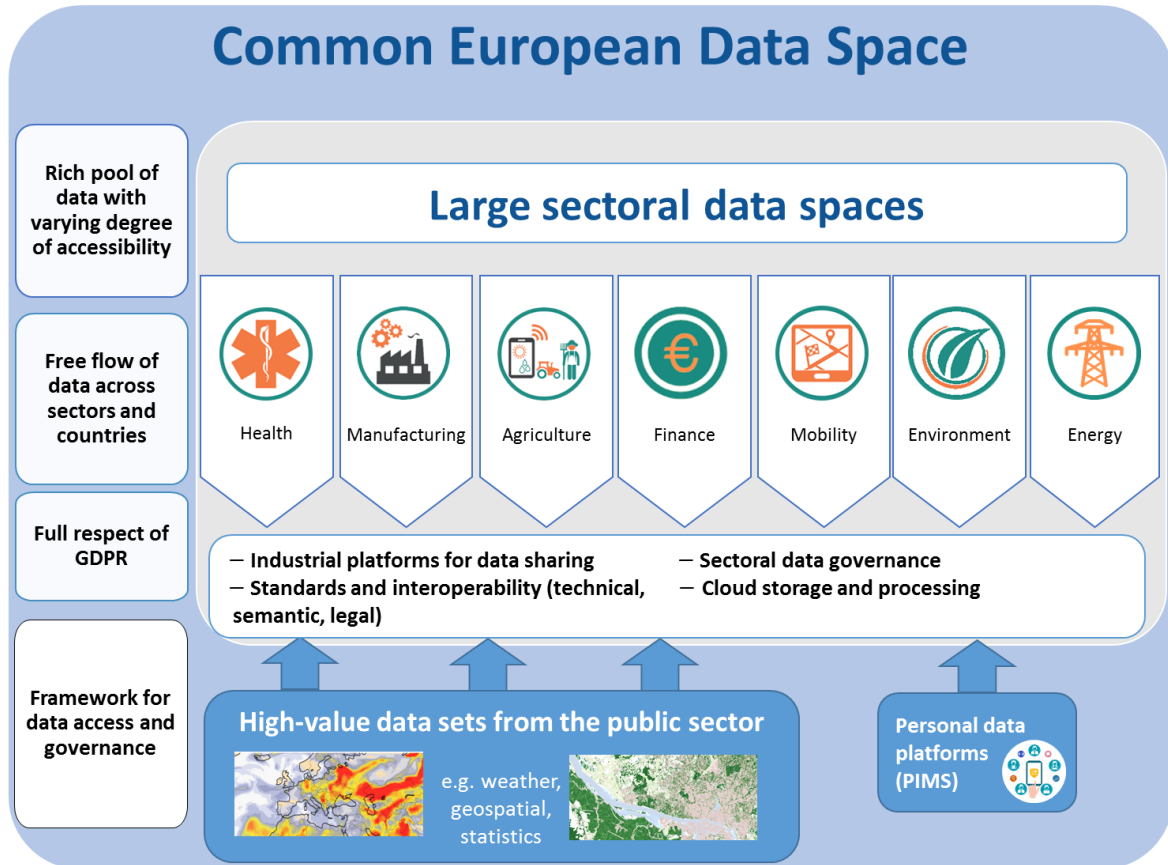
Figure 1: Elements of a common European Data Space *(source: DG CNECT)*

The digital ecosystem for the environment and sustainability will be a cornerstone component of the envisaged Green Deal data space. Together with other digital ecosystems under the Green deal data space (e.g. Circular Economy, Climate adaptation …), and other components (digital twin, knowledge, research, financing …) it will contribute to the development of a European Green Deal data space as a subset of the common EU data space that is interoperable with other sectoral data spaces, allowing transparent and seamless exchange of data. It will have elements from and links to all the sectors as identified in Figure 1.

In building the future digital ecosystem, four building blocks[15] need to be adressed. As far as it is about spatial data the work programme should contribute to this with different extent :

Data
- Data standards (including synergy with statistical data) and quality assurance
- Data validation guidelines
- Data management (storage, curation, preservation)
- Core reference data and core environmental data

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[15] Adapted from UN environment discussion paper "The case for a digital ecosystem for the environment"

- Open Data

Infrastructure
- Data management, semantic mapping
- Integration of data, harmonisation
- Access to data: near real time data through APIs, web services
- Data processing

Analysis
- Transparent, QA data analytics and algorithms
- Verification of methods
- Shared, open algorithms
- National co-validation

Applications
- Tools matching policy needs with actionable info
- User app, dashboards (tailor made for different user types)
- Tools monitoring environmental impact

When developing these activities, the following challenges have to be managed
- Access to datasets, governance of datasets
- Quality, transparency, openness of data and algorithms
- Protecting privacy, security, intellectual property
- Environmental impact of the digital ecosystem e.g. related to resource usage ("Greening the green dataspace")

3.2   Area of work 2: "Towards a common implementation landing zone"

This area of work has the objective to support the transition towards the vision defined in area of work 1 by achieving a better balanced and more homogeneous implementation for a set of key priority data sets as a 2022 landing zone for the implementation of the INSPIRE Directive.

To achieve this goal and promote and maximize the reuse of already available national spatial data infrastructures, as originally intended by the INSPIRE Directive, the following targeted actions should be considered towards a common implementation landing zone:

1. ***Define the INSPIRE "crown jewels"*** *– those data sets/themes, for which tangible benefits for environment policy and the implementation of the European Green Deal can be expected.*
   o Action 2.1: Identify a limited core set of data for which interoperability should be pursued. The priority data sets for reporting[16], the priority geospatial datasets for the European Commission[17] and the work on the High-Value Dataset implementing act under the Open Data Directive provide a good framework for defining this core set of data and drive this approach.

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[16] https://webgate.ec.europa.eu/fpfis/wikis/x/W4LdEQ

[17] https://ies-svn.jrc.ec.europa.eu/attachments/download/2536/%5BDOC11_rev%5D_Priority%20Geospatial%20Datasets%20for%20the%20European%20Commission.pdf

2. *Develop an implementation plan to **focus implementation efforts to maximise availability, ensure interoperability and reach pan-European spatial coverage** for this well-defined set of priority data.*

   o Action 2.2: Diversify and where possible relax the technical implementation guidance for what is needed for each data set e.g. every data set needs to have metadata, some selected priority data sets need to be published with INSPIRE services but all data sets should be accessible somehow. And an even more limited number of data sets need to be harmonized based on tangible use cases.

   Any priority setting approach has its intrinsic logic that one area is prioritised over another but that ultimately, step-by-step, all issues get addressed in a systematic and efficient manner. Any EU priorities complement any national and other priorities which are set elsewhere and do not alter in any way the legal obligations set out by the Directive.

3. *Continue work on **simplifying and mainstreaming the technical requirements** of the INSPIRE Directive, taking into account emerging paradigms, standards and technologies and their usability for the Green Deal data space.*

   o Action 2.3: eliminate INSPIRE specific extensions to metadata and services to support off the shelf software;

In addition, this working area will also include an action (2020.2.4) to support the operation and maintenance of the central components supporting the INSPIRE infrastructure (the INSPIRE knowledge base, geoportal, incl. the monitoring and reporting tools, validator and forum/helpdesk).

3.3   Area of work 3: "Green Data4All"

The "Alignment" Regulation 2019/1010[18] that was adopted in May 2019 mandates the Commission to carry out an evaluation of the INSPIRE Directive no later than 1 January 2022 and at least every five years thereafter. **Although the MIG's direct involvement in this area of work will be limited to consultation of the MIG as advisory body, a specific action (2020.3.1) is proposed for the Work Programme as a placeholder for possible future activities.** The Commission might seek the opinion of the Member States experts as part of the evaluation consultation strategy and the evidence gathering.

This area of work can be influenced by different developments:

• the development of a European Common data space and more specifically the Green Deal data space, with its GreenData4All initiative that was announced under the Data Strategy for Europe,

• the Open Data Directive and its implementing act on High-Value Data Sets,

• the need for better use of satellite data,

• and other emerging data-related initiatives.

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[18] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32019R1010

To use the major potential of data in support of the Green Deal priority actions on climate change, circular economy, zero pollution, biodiversity, deforestation and compliance assurance, a Common European Green Deal data space will be developed. **DG ENV's action to develop this Green data space will be a "Green Data4All" initiative**, which (following an evaluation/impact assessment) will aim to review and, if necessary, revise two pieces of existing legislation:

- The Access to Environment Information Directive (2003/4/EC);
- The INSPIRE Directive (2007/2/EC) dealing with geospatial data for the environment;

The overall objective is to ensure that the most modern and innovative technologies are used to deliver on basic European values of transparency and democracy, help channel the energy from EU citizens to contribute to European Green Deal solutions and minimize administrative burden by using less paper and more digital processes.

The "Green Data4All" initiative is designed to contribute to the Commission's Data Strategy that was published and presented on 19 February 2020.

The new Open Data and the re-use of Public Sector Information Directive (PSI – 2019/1024/EU) has created an ambitious reference point for public data. In the environmental domain, existing provisions already exist since 2003. They are still essential because they enshrine rights (established by the Aarhus Convention and transposed by Directives 2003/4/EC and 2003/35/EC) beyond what is set by the PSI Directive and set out technical details (through the INSPIRE Directive 2007/2/EC) that environmental authorities need to rely upon to share data for the purpose of tackling transboundary environmental problems.

However, these existing Directives are increasingly outdated since they were drafted at a time where the Internet and data management technologies were in their infancy. Moreover, some provisions are obsolete and not fully aligned with the Open Data Directive. The **"Green Data4All"** initiative will address these issues and contribute across all environmental areas to help harness the power of big data and artificial intelligence for the benefits of the European Green Deal.

There are many ongoing initiatives (Climate Pact, Digital Europe Programme, High Value Datasets under the Open Data / PSI Directive, etc.) which are relevant and need to be coordinated with the Green Data 4All initiative. The DG ENV contribution under this initiative will focus on a dedicated action which combines Better Regulation duties (to evaluate, simplify and modernise our existing acquis) with the ambition to improving data governance and citizens' engagement for climate and environment policies ready for 2030.

Another element is the need to better use satellite (Copernicus) data for environmental monitoring and compliance assurance. The initiative can also help in the convergence of use of High-Performance Computing, cloud data and Artificial Intelligence resources for Earth system modelling[19]. The suggestion is to bring together European scientific and industrial excellence to develop a very high precision digital model of Earth ("Digital Twin of the Earth") that will be used to achieve breakthroughs

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[19]   https://ec.europa.eu/digital-single-market/en/news/convergent-use-high-performance-computing-cloud-data-and-artificial-intelligence-resources

in Europe's climate and environmental prediction and crisis management capabilities. For such an ambition to succeed, the access and sharing of "green data" will need to significantly improve and the updating of the existing legal framework will be essential for that.

3.4 Other activities

The activities under the above working areas are clear priorities resulting in the core set of activities agreed and implemented in the context of the WP 2020-2024. The EU partners (DG ENV, JRC, ESTAT and EEA) will allocate the majority of their resources to implement these core activities and national authorities active in the MIF are called upon to review their investments into the MIF and align them with this WP, as appropriate. However, it is recognised that there are other valuable activities or interests of national experts, e.g. in the context of the Digital Europe Programme or other funded programmes, pan-European and regional initiatives. Actions or projects of wider interest are documented in Annex 2 to the WP 2020-2024. This list is mainly for information purposes and every authority can decide individually how far it engages and uses the results of such activities and projects.

Whilst the Annex 2 does not form part of the WP 2020-2024, there may be circumstances or particular results which could indeed be valuable for the INSPIRE implementation overall. E.g. it could be envisaged that a particular standard or guidance is considered useful to be applied in the more formal INSPIRE context. Therefore, the procedure for proposing and endorsing good practices[20] can be used by the stakeholder communities as regards such particular projects or results, utilising the INSPRE Community Forum to share and discuss. The MIG-T can then evaluate proposals as well as propose new ones. As a result, the MIG could decide to endorse a particular INSPIRE "product" stemming from a project outside the WP and promote it to good practice under the INSPIRE implementation.

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[20] https://inspire.ec.europa.eu/portfolio/good-practice-library

4 Stakeholder engagement

The development and implementation of the INSPIRE Directive is characterised by a wide consultative and collaborative approach. With a strong focus on use cases as the driving force for data sharing and interoperability, and good practices as drivers for technical interoperability, the engagement with stakeholders has always been important and will remain increasingly important.

Many actions to engage with a wide group of stakeholders have successfully taken place in the past, e.g. through INSPIRE Community Forum[21] (former Thematic Clusters), workshops, webinars, trainings[22] (communication material all accessible via INSPIRE Knowledge base[23]). In particular, the annual INSPIRE Conference[24] has proven to be a widely recognised forum and gathering of the European spatial data community. Despite these efforts and achievements, the engagement with some stakeholder groups has been less successful. Besides the need for a closer collaboration with the environmental policy and reporting community to deliver the added value of the INSPIRE Directive in support of the objectives of the European Green Deal and better implementation of environmental legislation, a more systematic and structured engagement with other communities (public and private) engaged in developing the data and digital economy, including the digital innovation communities, should be sought. The needs and use cases of a fast-moving and inclusive digital transition cannot always be mirrored by legislative process timescales but should feed into the further development and implementation of the European spatial data infrastructure to guarantee its fitness for purpose and maximise its reuse.

This extended users and stakeholder focus will also need to be reflected within the specific actions under the Work Programme. Some organisational aspects of the MIF will be reviewed and the focus of stakeholder engagement will particularly be shifted to the environment and digital policy community in view of the Commission's ambition to develop a European Green Dataspace in which the INSPIRE Directive will play a key role as an instrument to implement the objectives of the European Green Deal.

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[21] https://inspire.ec.europa.eu/forum

[22] https://inspire.ec.europa.eu/portfolio/training-library

[23] https://inspire.ec.europa.eu/

[24] http://inspire.ec.europa.eu/index.cfm/pageid/501

5   Working arrangements and practicalities

The mandate and the current rules of procedures (RoPs)[25] that were established under the MIWP 2016-2020 and agreed with the MIG continue to apply.

The WP holds no mandate in relation to tasks assigned to the **INSPIRE Committee**. Activities mandated to the Committee are proposed by the Commission and the Committee acts in accordance with its own RoPs and can, of course, decide to make use of the expert structures under the MIG and the Work Programme for preparing certain deliverables that it is mandated to address. The Commission will ensure a smooth functioning between the Committee and the WP actions by ensuring a regular information exchange and by arranging, where and as appropriate, back-to-back meetings of the Committee with the MIG.

The **MIG** is the policy sub-group with particular focus on strategic and political questions and with responsibilities to agree upon the WP as well as to endorse outcomes of the WP and thereby give them an informal (i.e. not adopted by Commission or Committee) but still official status (i.e. validated by the official Commission INSPIRE Expert Group).

The **MIG-T** is the operational and technical arm for the INSPIRE implementation. Many of the concrete actions are carried out under the remit of the MIG-T. However, the interplay between MIG-T and MIG will be refined, e.g. by sequencing the meetings allowing for appropriate preparation and follow up of the meetings.

It is also common practice to establish dedicated sub-groups for the execution of tasks. As a rule, it is for the MIG, with possibility for suggestions from the MIG-T, to decide on establishing these sub-groups. The mandate of sub-groups should be reviewed and agreed by the MIG.

The WP 2020-2024 in its present form represents a work programme until 2024 taking into account that the evaluation and possible review of the Directive might substantially impact the WP beyond 2022. The detailed arrangements for the review are set out below. Outreach to experts outside the WP and the MIF is essential for the INSPIRE implementation success and collaboration should be sought with relevant communities working on environmental and digital policies.

Finally, implementation of the agreed actions under the WP will not happen if the necessary resources are not allocated by all partners involved. The EU partners will prioritise their resources around the agreed core actions. However, a concrete commitment can and will only be made on an annual basis following the availability and agreement of the needed resources for such actions in the EU budget. Member State experts are invited to do the same and, ideally, inform the MIG about their investment. Actions without agreed and committed resources cannot be agreed as part of the WP. In some cases, a priority of allocation of resources will also be necessary. The Commission will, e.g. consider the re-imbursement of experts in line with its procedures and budget availability, as an effective investment in the INSPIRE implementation given the administrative costs involved.

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[25]   https://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetail-Doc&id=38180&no=4

6   Conclusions and outlook

The WP 2020-2024 is designed to continue the successful work under the MIF in the past. The WP covers the period from 2020 to 2024 clearly identifying the concrete core actions in more detail for the period 2020-2022, taking the implementation of the INSPIRE Directive to a common landing zone supporting tangible European use cases, and less detailed beyond 2022 in anticipation of the evaluation and possible review of the INSPIRE Directive. Hence, a regular review of the WP will be undertaken by the MIG with input from the MIG-T, in particular monitoring progress and delivery of the agreed actions, ensuring quality control of the deliverables and identifying new activities to be included in Annex 1, provided they contribute to one of the agreed areas of work and provided resources are available and allocated. At the end of every year, a review of the Work Programme and an updating of the specific activities and actions will take place. Finally, the partners in the WP should reach out to other communities to promote the work agreed under the WP and to increase the support base for a successful implementation of the INSPIRE Directive.

Annex 1: Core actions under the MIWP linked to the main working areas

This annex features the core MIWP 2020-2024 actions, endorsed by the INSPIRE Maintenance and Implementation expert Group, under their respective working areas.

Actions (Annex)

Working Area	Action	Description	Start date / Date of completion	Who	Endorsement
1	1.1 Towards the definition of digital Ecosystem for the environment and sustainability	Include the following sub-actions of exploratory* nature (studies, pilots, tests): 1) Data content level (2020/21) • Identification of the full spectrum of data sources relevant for environment/sustainability: official monitoring data, INSPIRE, other public sector data, Earth Observation/Copernicus, citizen science campaigns, sensors, drones, etc. • Definition of the reference data for the data space (covering environment, geospatial, climate-related data – synergies with HVD/PDS/Core Reference Data) • Raw Data vs Analysis-Ready Data; Near Real Time data; Private sector data; • Data quality, data validation (semantic validation) 2) Data governance level (2020/21) • Data policy sharing and licensing schemes (inc. Open Data) • Data management aspects: preservation, curation, etc.	Q3/2020 – Q2/2022	EC+EEA, MS (MIG sub-group(s))	

| | | • Data governance models

• Data protection

3) Technological/Infrastructure level (2020/21)

• Architectural options and technological solutions (AI and ML, big data analytics, data cubes)

• Standards and interoperability aspects (interfaces –e.g. open APIs-, formats)

4) Analytical level (2021/22)

• Data integration, data harmonisation aspects

• Analytical methods, algorithms

5) Application level (2021/22)

• Definition of use cases / pilots in the domains of environmental and climate policies, circular economy, climate adaptation… (inc. definition of data content/quality requirements, tools and apps needed, functionalities, etc)

• Data space apps and tools (e.g. European Dashboard to monitor our natural resources/ecosystem services - or Green Deal ambitions – at different levels)

• Environmental impact monitoring

6) Interoperability with other Data Spaces in the overall framework of the EU Common Data Space (2022)

• Interactions across sectors (bi-directional) | | | |

2	2.1 Need-driven data prioritisation	Prioritisation methodology and selection of core INSPIRE data sets, driven by the new political agenda (e.g. Green Deal, EU Data Strategy …), new or emerging legal frameworks and (e.g. High Value Data sets under the Open data directive, EU common data spaces …) ongoing prioritisation initiatives (e.g. the Commission geospatial requirements paper and the activity on priority data for environmental reporting …). Integrates action 2016.5 on Priority list of data sets for eReporting	Q1/2020-Q4/2020	EC+EEA, MS (MIG sub-group(s))	
2	2.2 Priority-driven implementation	Defining INSPIRE implementation maturity levels and landing zone expectations for the availability (metadata), interoperability and accessibility (network services) of prioritised and non-prioritised data sets. Maximizing and promoting the reuse of national (spatial) data infrastructures and existing environmental information systems.	Q3/2020-Q2/2021	EC+EEA, MS (MIG sub-group(s))	
2	2.3 Simplification of INSPIRE implementation	In line with the priority driven implementation (action 2020.1.1) and in preparation of a possible review of the legal framework, the implementing acts implementing the Directive regarding Network Services and Metadata and the corresponding technical guidelines will be screened to identify areas where most gains could be harvested by simplification (e.g. data-service linking), streamlining with other digital initiatives and updating to the contemporary state of technology. Integrates 2020.1 OAPIF – OGC API Features encoding good practice and 2019.2 Improving accessibility of data sets through network services	Q2/2020-Q2/2021	EC+EEA, MS (MIG sub-group(s))	
2	2.4 Central infrastructure components	Maintenance and operation of the central components supporting the INSPIRE infrastructure, including the geoportal, validator, monitoring and reporting tools, knowledge base, forum/helpdesk.	Q1/2020-Q4/2022	EC+EEA	
3	3.1 GreenData4all initiative	Commission initiative which aims to review and, if necessary, revise two pieces of existing legislation: INSPIRE as well as the Access to Environment Information Directive (2003/4/EC). The overall objective is to ensure that the most modern and innovative technologies are used to deliver on basic European values of transparency and democracy, help channel the energy from EU citizens to contribute to European Green Deal solutions and minimize administrative burden by using less paper and more digital processes.		EC+EEA	

		MIG's direct involvement in this area of work will be limited to consultation of the MIG as advisory body. This action in the WP is considered as a placeholder for possible future related activities.			

Area of work 1: A digital ecosystem for the environment and sustainability

Action 1.1: Towards a digital ecosystem for the environment and sustainability

Title	Towards a digital ecosystem for the environment and sustainability			
ID	2020.x			
Status	☒ Proposed	☐ Endorsed	☐ In Progress	☐ Completed
Issue	The current architecture of INSPIRE is outdated and does not reflect to the desired extent the challenges and opportunities related to the emergence of new data sources and new technologies. In addition, INSPIRE is often seen as a monolithic infrastructure with few links to other existing infrastructures and initiatives. At the same time, the newly adopted European strategy for data (COM(2020) 66) provides an excellent opportunity for the technological evolution of INSPIRE within the broader context of the foreseen European Green Deal data space. In order to achieve that, emerging technologies, data sources and approaches have to be included in INSPIRE to ensure that the infrastructure evolves to support a self-sustainable data ecosystem.			

Title	Towards a digital ecosystem for the environment and sustainability
Proposed action	The action will work on four interdependent strands of activities: 1. A new vision for the technological evolution of INSPIRE will be developed in order to integrate the infrastructure in the European Green Deal data space. 2. An updated reference architecture that translates the vision in concrete technical approaches will be developed through the extensive use of an agile approach and sandboxing. 3. A stack of standards (incl. de-facto standards) and solutions that comply with the legal provisions will be prepared and endorsed by the MIG through the means of non-legally binding INSPIRE good practices. 4. The action will contribute to the improvement of the discoverability of data through search engines and the proposal of a common approach to licensing that follows a well-established framework (e.g. as defined by the Creative Commons).
Links & dependencies	• Policy and legal developments on EU common data spaces in general. • Technical implementation examples and good practices from other domains. • Lessons learned will feed into the review and possible revision of the INSPIRE legal framework under the "Green Data4All" initiative (see Action 3.1). • Link with central INSPIRE components and Technical Guidelines (see Action 2.4)
Organisational set-up	The action is led by the JRC, with contribution by the MIG, MIG-T, European Commission DGs and the EEA. Temporary sub-groups and networks of experts will be established, and where necessary, procurements for ad-hoc tasks will be prepared. The action will engage with a broad spectrum of relevant stakeholders such as data reusers, standardisation bodies, solution and data providers, software developers and open source communities.
Lead	Lead: JRC

Title	Towards a digital ecosystem for the environment and sustainability
	Contributors: MS, solution providers, standardisation bodies, other actors in the Green Deal data space.
Scope	Modernising the existing approaches for sharing data in INSPIRE in accordance with emerging technological trends and the political agenda defined by the European Strategy for Data. Fixing bugs and maintaining existing artefacts (e.g. application schemas, UML models) is out of the scope of the action. They will be dealt with in Action 2.3.
Tasks	Task 1. Vision for the technological evolution of INSPIRE within the context of the European Green Deal data space; Task 2. New reference architecture for the INSPIRE infrastructure as part of the Green Deal data space; Task 3. Experiment and summarise lessons from the use of modern technologies and standards through sandboxing; Task 4. Create and endorsement of a stack of 'enabling' good practices for data provision (based on e.g. OGC APIs, different encodings: GeoJSON, GeoPackage, VectorTiles) in collaboration with standardisation bodies, software vendors and open source projects; Task 5. Improve the discoverability of INSPIRE data through search engines and combine them with other sources (citizen data, private data, research data, data on all levels of public administration); Task 6. Develop and promote a common approach for licensing of datasets in accordance with existing licensing frameworks (e.g. Creative Commons).
Outcomes	Modernised technical framework of INSPIRE that is well integrated into the European Green Deal data space and ensures the evolution of INSPIRE into a digital ecosystem for the environment and sustainability.

Title	Towards a digital ecosystem for the environment and sustainability	
Proposed Impact	☐ Technical Adjustment / Bug Fixing ☒ Technical Improvement / Development ☒ Practical Support for Implementing Process ☒ Cost Reducing Effect for Implementing Process ☒ Direct Support on Policy-Making / - Activities	
Timeline	Date of Kick-off: October 2020	
	Proposed Date of Completion: June 2023	
Required human resources and expertise	- MIG and MIG-T contribution; - Establishment of expert groups on an ad-hoc basis; - Engagement of relevant communities (open source projects, standardisation bodies, etc.).	
Required financial resources and possible funding	- Funding foreseen by DG ENV through the forthcoming Administrative Arrangement with the JRC. - In kind contribution of the MIG and MIG-T.	
Risk factors	Overall risk level of the action ☐ High ☒ Medium ☐ Low	Risk factors to be considered ☐ Missing Resources ☒ High Complexity ☐ Interdependencies with other Actions Others: ☒ Low level of engagement of the relevant stakeholders

Title	Towards a digital ecosystem for the environment and sustainability
		☒ Inter-dependencies with horizontal guidelines and rules developed for the European data spaces and with specific guidelines and rules for the Green Deal data space.

Area of work 2: Towards a common implementation landing zone (objectives 2-4)

Action 2.1 Need-driven data prioritisation

Title	Need-driven data prioritisation			
ID	2020.x			
Status	☒ Proposed	☐ Endorsed	☐ In Progress	☐ Completed
Issue	The overarching vision for a European spatial data infrastructure for the purposes of EU's environmental policies and policies or activities which have an impact on the environment (Article 1 of INSPIRE Directive 2007/2/EC) has not changed since the inception of the Directive, and is to promote data sharing and put in place easy-to-use, transparent, interoperable spatial data services which are used in the daily work of environmental and other policy makers and policy implementers across the EU at all levels of governance as well as businesses, science and citizens. To realise the vision and to maximize and facilitate the reuse of data across administrative levels, borders and sectors, data offerings from different sources should be consistent and comparable. At the same time the INSPIRE community has clearly indicated the need to			

Title	Need-driven data prioritisation
	drive the further implementation (data and services availability, accessibility and interoperability) of the Directive by a real demand and tangible use cases. Furthermore it is suggested to speed up the implementation by doing less but doing it quicker. The data prioritisation methodology would consist of selecting those data sets that satisfy concrete needs of the stakeholders (local, regional, national and European administrations for implementation of Sustainable Development Goals, Community legislation, etc.) and for which interoperability should be pursued. Current INSPIRE implementation is still very heterogeneous and therefore only has limited ability for reuse across borders and for constructing pan-European datasets and applications. There are actually current several ongoing initiatives and projects exploring the possibility of using the INSPIRE infrastructure directly for the purpose of creating pan-European datasets and applications (e.g. Eurostat projects, Copernicus in-situ activities, IACS data exchange). Common to all these projects is the need for a specific governance which engages data providers and investigates technical capacities or obstacles. Dissemination of results and lessons learnt from such activities is also key for future improvements. Importantly, the prioritisation of certain INSPIRE spatial data themes and datasets in the scope of clear use cases and policy requirements is considered essential to achieve the goal of constructing pan-European datasets and ensure their re-use. In this sense, the priority list of datasets for e-Reporting, developed under the previous Work Programme, has already proven useful but it needs to be regularly updated to reflect changing reporting requirements or legislation. Synchronisation between different priority requirements and availability of datasets will also bring synergies and increase possibility of reusing datasets for different purposes. Furthermore and beyond the scope of ongoing prioritisation initiatives (e.g. the Commission geospatial requirements paper and the activity on priority data for environmental reporting …), the data prioritisation should also consider the new political agenda (e.g. Biodiversity strategy, Circular Economy Action Plan, Zero Pollution Action Plan …) and emerging legal frameworks and (e.g. High Value Data sets under the Open data directive, EU common data spaces …).
Proposed action	1. Develop a prioritisation methodology.

Title	Need-driven data prioritisation
	2. Document data priorities (use case(s), data requirements, reuse capacity …) and demonstrate possible data usage. 3. Manage data priorities as list(s) of priority INSPIRE datasets (e.g. priority list of datasets for e-Reporting, core data sets, High Value Datasets …) and develop guidance for their implementation. 4. Identify, discuss and remediate priority data implementation issues e.g. by considering or proposing alternative data sources (Copernicus, open source data …) to complete pan-European availability. 5. Support fast-track data requests, e.g. based on the Commission request for spatial data. 6. Monitor the availability of the data priority datasets in the INSPIRE Geoportal
Links & dependencies	Action 2.2. – provide information within the agreed roadmap Action 2.3 – readiness for uptake of simplifications in the INSPIRE infrastructure Action 2.4 – availability of correct and updated INSPIRE artefacts: data specifications, UML, encoding schemas, alternative encodings and rules, registers (code list), INSPIRE Geoportal functionalities
Organisational set-up	The action is led by the ENV, ESTAT and EEA, with contribution by the JRC, MS and European Commission DGs (depending on use cases). INSPIRE MIG and MIG-T will be regularly informed and consulted. The established temporary sub-group for action 2016.5 or its successor will be used for coordination. The action will engage with relevant stakeholders such as users of the priority data, data providers and policy implementers.
Lead	Lead: ENV, ESTAT, EEA Contributors: JRC, MS
Scope	Drive the further implementation (data and services availability, accessibility and interoperability) of the INSPIRE Directive by a real demand and tangible use cases by setting data priorities. Supporting the creation and availability of pan-European datasets and applications for different policies, e.g. environmental policies, European Green Deal data space

Title	Need-driven data prioritisation
Tasks	Task 1. Prioritisation methodology and processes (estimated deadline: December 2021) Task 2. Document the data priorities Task 3. Manage the list(s) of priority datasets including list of priority datasets for e-Reporting, core data sets, High Value Datasets, or others (annually reviewed, estimated deadline: December each year until 2024) Task 4. Monitor implementation and address identified issues. Initiate pilot projects to remediate issues or demonstrate different uses of data, (annually reviewed, estimated deadline: November each year until 2024) Task 5. Process fast-track data requests (ad hoc) Task 6. Improve the INSPIRE Geoportal discoverability and visualisation of priority datasets and provide statistics (continuous task in line with the INSPIRE Geoportal development and evolution - see action 2.4, estimated deadline: aligned with the INSPIRE Geoportal releases)
Outcomes	• Prioritisation methodology and procedures • List of priority datasets • Documented data priorities • Dissemination of results and communication • Higher availability and visibility of priority datasets in the INSPIRE Geoportal
Proposed Impact	☐ Technical Adjustment / Bug Fixing ☐ Technical Improvement / Development ☒ Practical Support for Implementing Process ☒ Cost Reducing Effect for Implementing Process ☒ Direct Support on Policy-Making / - Activities
Timeline	Date of Kick-off: October 2020
	Proposed Date of Completion: December 2024

Title	Need-driven data prioritisation	
Required human resources and expertise	• MIG and MIG-T contribution; • Establishment of expert groups on an ad-hoc basis; • Engagement of relevant communities (reporting communities, users of priority datasets, etc.).	
Required financial resources and possible funding	• In kind contribution of partners	
Risk factors	Overall risk level of the action ☐ High ☒ Medium ☐ Low	Risk factors to be considered ☒ Missing Resources ☐ High Complexity ☒ Interdependencies with other Actions Others:

Action 2.2 Roadmap for priority-driven implementation

Title	Roadmap for priority-driven implementation			
ID	2020.x			
Status	☒ Proposed	☐ Endorsed	☐ In Progress	☐ Completed
Issue	Certain aspects of the implementation of the INSPIRE Directive (e.g. harmonization of all data in its scope) are still considered as cumbersome or even disproportionate. The broad spatial data scope of the Directive and the high level definition of the data scope through			

Title	Roadmap for priority-driven implementation
	its 34 themes has resulted in a diversified and non-comparable offering across Member States. The envisaged common landing zone should address these issues whilst being realised in compliance with the existing legal provisions documented in the INSPIRE Directive and its implementing regulations. Under Action 2.1 a commonly agreed prioritisation of the data scope will be pursued. This action will build on this clear data prioritisation and will aim at defining priority-driven technical requirements for the documentation, availability, accessibility and interoperability of data and spatial data services using the flexibility foreseen in the legal framework. To facilitate a feasible implementation that responds to tangible needs, the identified flexibilities in the legal framework would be used to diversify and where possible relax the technical implementation guidance for what is needed for each data set (e.g. every data set needs to have published metadata, a clearly defined limited number of data sets need to be harmonized ...).
Proposed action	The action will work on the following strands of activities: • Identifying the flexibilities of the legal framework, building on previous simplification efforts. • Develop implementation maturity levels based on the level of interoperability, data priorities and identified legal flexibility. • Validate and pilot the proposed maturity levels on selected data sets. • Implementation support
Links & dependencies	• Outcome of Action 2.1 Need-driven data prioritisation • Interplay with Action 2.3 Simplification of INSPIRE implementation • Feed into Action 3.1 GreenData4All

Title	Roadmap for priority-driven implementation
Organisational set-up	The action is led by ENV, with contribution by the MIG, MIG-T, European Commission DGs and the EEA. A temporary dedicated sub-group will be established.
Lead	Lead: ENV Contributors: MIG, MIG-T, JRC, EEA, ESTAT, other EC Services
Scope	Rendering a common and comparable implementation of the INSPIRE Directive across Europe more feasible based on common data priorities and fit-for-purpose interoperability levels.
Tasks	Task 1: Identifying the flexibilities of the legal framework, building on previous simplification efforts. Task 2: Develop implementation maturity levels based on the level of interoperability, data priorities and identified legal flexibility (incl. legal validation). Task 3: Impact assessment of the proposal on existing and future implementation. Task 4: Pilot the proposed maturity levels on selected data sets. Task 5: Draft guidance (legal, political, technical) on application of maturity levels.
Outcomes	• A case-driven, consistent and comparable INSPIRE implementation across Europe. • Compliant implementation maturity levels for a more feasible and cost-effective implementation. • Implementation guidance.
Proposed Impact	☐ Technical Adjustment / Bug Fixing ☐ Technical Improvement / Development ☒ Practical Support for Implementing Process

Title	Roadmap for priority-driven implementation	
	☒ Cost Reducing Effect for Implementing Process ☒ Direct Support on Policy-Making / - Activities	
Timeline	Date of Kick-off: Q4 2020	
	Proposed Date of Completion: Q4 2021	
Required human resources and expertise	• MIG and MIG-T contribution; • Establishment of a temporary dedicated expert group; • Legal support.	
Required financial resources and possible funding	• Funding foreseen by DG ENV through the forthcoming Administrative Arrangement with the JRC. • In kind contribution of the MIG and MIG-T.	
Risk factors	Overall risk level of the action ☐ High ☒ Medium ☐ Low	Risk factors to be considered ☐ Missing Resources ☐ High Complexity ☒ Interdependencies with other Actions Others: ☒ Legal consistency

Action 2.3 Simplification of INSPIRE implementation

Title	Simplification of INSPIRE implementation			
ID	2020.x			
Status	☒ Proposed	☐ Endorsed	☐ In Progress	☐ Completed
Issue	The implementation of INSPIRE is perceived as complex by many stakeholders and existing software tools do not always fit to the implementer and user needs. During the implementation, there are multiple bugs discovered in existing TGs, UML models, XML schemas that are at present not addressed in a systematic way and with a low level of engagement of the community. In addition, the current approach for data-service linking in the TGs (metadata and network services) is complex and provides room for different interpretations of the requirements. All of this, combined, reduces the overall benefit and limits the uptake of the INSPIRE infrastructure.			
Proposed action	The action will put a strong emphasis on ensuring that off the shelf software tools and libraries can be used for implementing INSPIRE requirements (as defined in Action 2019.2). An expert group under the governance of the MIG-T will be established to review and revise the existing technical guidelines, UML models and application schemas without introducing changes that not aligned with the INSPIRE IRs. In doing so, emphasis would be put on (i) minimising INSPIRE-specific extensions, and (ii) leveraging on solutions that are proven to work in practice. Where applicable, issues that would have impact on the IRs will also be captured and documented.			
Links & dependencies	Action 1.1. Action 2.2. Action 2.4.			

Title	Simplification of INSPIRE implementation
Organisational set-up	The action is led by the JRC, with contribution by the MIG-T, European Commission DGs and the EEA. Temporary sub-groups and networks of experts will be established, and where necessary, procurements for ad-hoc tasks will be prepared.
Lead	Lead: JRC Contributors: ENV, EEA, ESTAT, MS
Scope	The action will focus on the simplification of the existing technical requirements of the INSPIRE implementation. Modernising the infrastructure is addressed in Action 1.1., and is therefore out of the scope of this action. In addition, the migration of the existing technical guidelines, UML models, etc. is addressed in Action 2.4, and is out of the scope of this action.
Tasks	Task 1. Develop a procedure for updates of INSPIRE artefacts (e.g. Technical Guidelines, UML models, XML schemas); Task 2. Review and amendment of selected artefacts. Priority would be given to TGs that have the highest impact on the implementation; Task 3. Agree on a simplification approach for data-service linking and update the existing metadata TG accordingly.
Outcomes	Simplified, flexible and transparent approach for the update of the technical artefacts in INSPIRE that also considers the support by software tools for both implementers and users.
Proposed Impact	☒ Technical Adjustment / Bug Fixing

Title	Simplification of INSPIRE implementation	
	☒ Technical Improvement / Development ☒ Practical Support for Implementing Process ☒ Cost Reducing Effect for Implementing Process ☐ Direct Support on Policy-Making / - Activities	
Timeline	Date of Kick-off: October 2020	
	Proposed Date of Completion: June 2023	
Required human resources and expertise	• MIG and MIG-T contribution; • Establishment of expert group(s) for review and update of the INSPIRE artefacts on an ad-hoc basis; • Engagement of relevant communities (open source projects, standardisation bodies, etc.).	
Required financial resources and possible funding	• Funding foreseen by DG ENV through the forthcoming Administrative Arrangement with the JRC. • In kind contribution of the MIG and MIG-T.	
Risk factors	Overall risk level of the action ☐ High ☒ Medium ☐ Low	Risk factors to be considered ☒ Missing Resources ☒ High Complexity ☐ Interdependencies with other Actions Others: ☒ Low level of engagement of the MIG and MIG-T

Action 2.4 Central infrastructure components

Title	Central infrastructure components			
ID	2020.x			
Status	☒ Proposed	☐ Endorsed	☐ In Progress	☐ Completed
Issue	Central INSPIRE components such as the Geoportal, Validator, Registry, Forum and INSPIRE Knowledge Base, are essential for the implementation and evolution of the INSPIRE infrastructure. All of those components were developed separately and under different contexts, which has led to the use of different technologies, establishment of individual helpdesks, highly customised systems. In addition, the tools are at present tightly coupled with the JRC infrastructure. At present, the JRC is mainly involved with the evolution of the central components. Such an approach is not sustainable in the long term. Establishing adequate governance mechanisms, creating communities and establishment of strategic partnerships within the INSPIRE community and with other stakeholders, e.g. open source communities would ensure smooth and shared evolution of the components. In addition most, if not all of the tools, can be reused in other contexts which in turn creates multiple opportunities for their long-term maintenance and evolution.			
Proposed action	The goal of this action is twofold. Firstly, it will cover the operation of the central components, incl. for the needs of the annual monitoring and reporting. Secondly, the action will come up with practical solutions for the evolution of those key infrastructure components and come up with adequate governance models for the components and related artefacts which do not only rely on the work of the JRC. In doing so, the action will focus on streamlining the underlying software and systems, based on a proposal to phase out, consolidate and/or move them to EC corporate solutions, in order to simplify long-term maintenance.			

Title	Central infrastructure components
Links & dependencies	Action 2.3
Organisational set-up	The action is led by the JRC, with contribution by the MIG-T, European Commission DGs and the EEA. Temporary sub-groups and networks of experts will be established, and where necessary, procurements for ad-hoc tasks will be prepared.
Lead	Lead: JRC Contributors: ENV, EEA, MS
Scope	Establish appropriate governance models, operate and evolve the central INSPIRE software components in close collaboration with relevant stakeholders.
Tasks	Task 1. Operate and evolve the central infrastructure components; Task 2. Perform annual INSPIRE monitoring and reporting based on the INSPIRE geoportal and validator; Task 3. Simplify and align the approaches for different solutions (cloud hosting, common approach for helpdesks); Task 4. Establish governance approaches for central INSPIRE components and ensure interaction with stakeholders for the long-term sustainability of the components; Task 5. Migrate central components to mainstream ICT tools and cloud hosting.
Outcomes	Sustainable central INSPIRE components that are reusable within the context of the European Green Deal data space.
Proposed Impact	☒ Technical Adjustment / Bug Fixing ☒ Technical Improvement / Development ☒ Practical Support for Implementing Process

Title	Central infrastructure components
	☒ Cost Reducing Effect for Implementing Process ☐ Direct Support on Policy-Making / - Activities
Timeline	Date of Kick-off: October 2020
	Proposed Date of Completion: June 2023
Required human resources and expertise	• MIG and MIG-T contribution; • Establishment of expert groups on an ad-hoc basis; • Engagement of relevant communities (open source projects, standardisation bodies, etc.).
Required financial resources and possible funding	• Funding foreseen by DG ENV through the forthcoming Administrative Arrangement with the JRC. • In kind contribution of the MIG and MIG-T.

Risk factors	Overall risk level of the action ☐ High ☒ Medium ☐ Low	Risk factors to be considered ☐ Missing Resources ☒ High Complexity ☐ Interdependencies with other Actions Others: ☒ Low level of engagement of the MIG and MIG-T

Area of work 3: GreenData4All (objective 5)

Action 3.1 GreenData4All initiative

Title	GreenData4All initiative			
ID	2020.x			
Status	☐ Proposed	☐ Endorsed	☒ In Progress	☐ Completed
Issue	Mandatory evaluation by the Commission of the INSPIRE Directive by 1 January 2022. Subject to the outcome of an impact assessment, the modernisation and alignment with new or emerging legislation of the INSPIRE Directive (2007/2/EC) and the public access to environmental information Directive (2003/4/EC) is needed. Environmental geospatial and climate-related data are a prerequisite to better understand issues and trends on how our planet and its climate are changing and how society and economy are impacted. The timely availability of data can help strengthen evidence-based analytical capability for policy-making and implementation and is crucial to deliver on the Green Deal objectives.			
Proposed action	The evaluation of the INSPIRE Directive will also analyse the coherence between the INSPIRE Directive, the Public Access to Environmental Information Directive 2003/4/EC and Directive 2019/1024/EC on open data and the re-use of public sector information. The evaluation conclusions will feed the 'Greendata4all' initiative announced in the European strategy for data (COM(2020) 66 final) and may induce a revision of 2007/2/EC and 2003/4/EC.			
Links & dependencies	EU Green Deal Data Strategy for Europe			

Title	GreenData4All initiative
	High Value Data sets (Open Data Directive) Evolution of thematic environmental legislation, including reporting requirements Evolution of other policies (transport, agriculture, maritime, space, health, disaster management, research, security , climate change) Evolution of IT standards and technological progress
Organisational set-up	The action will be discussed in the MIG.
Lead	Lead: ENV Contributors: JRC, EEA, ESTAT, MS (as part of the evaluation consultation strategy)
Scope	Evaluation of the INSPIRE Directive. Followed by a possible review of the legal framework, subject to an impact assessment.
Tasks	MIG to provide input to the process and discuss deliverables.
Outcomes	Commission evaluation Staff Working Document. Evaluation report. Impact Assessment and if politically desired, a proposal to update the legal framework.
Proposed Impact	☐ Technical Adjustment / Bug Fixing ☐ Technical Improvement / Development ☐ Practical Support for Implementing Process ☐ Cost Reducing Effect for Implementing Process ☒ Direct Support on Policy-Making / - Activities
Timeline	Date of Kick-off: 1 July 2020

Title	GreenData4All initiative
	Proposed Date of Completion: 30 June 2023
Required human resources and expertise	Commission internal.
Required financial resources and possible funding	Commission internal.

Risk factors	Overall risk level of the action ☐ High ☒ Medium ☐ Low	Risk factors to be considered ☐ Missing Resources ☒ High Complexity ☒ Interdependencies with other Actions Others: ☒ Interdependencies with other legislation and political initiatives.

Annex 2: Other activities of interest (for information)

This annex includes other projects and activities of interest, e.g. from ISA[2] actions, Digital Europe Programme, Horizon Europe, ReportNET3.0, national or regional projects, etc.

Action	Description	Start data / Date of completion	Who
4.1 Reportnet 3.0 (2020.x)	Follow up on the development of the EEA Reportnet 3.0 reporting infrastructure in view of the reuse of INSPIRE data and services for reporting obligations.	1Q 2020 – 3Q 2021	INSPIRE CT Member State experts MIG for Information
	Grants fostering the collaboration between NMCA and NSI to enhance synergies	Q3 2020 – QX 20213	EC, MS
	Creation of Pan – European Datasets for the Core Reference Geospatial Data Themes including development of methodologies and reporting existing issues back to data providers	Q1/2020-Q4/2021	EC

Annex 3: Transition from the MIWP 2016-2020 to the MIWP 2020-2024

This annex describes the transition of the actions included in the 2016-2020 work programme to the WP 2020-2024. Actions from the MIWP 2016-2020 that will be further pursued will be included in Area of Work 1.

Transition of actions from the MIWP 2016-2020 to the WP 2020-2024

ID	Title	Status in the MIWP 2016-2020	Status in the WP 2020-2024
2016.4	Theme specific issues of data specifications & exchange of implementation experiences in thematic domains	Ongoing	Included in Annex 1 under Area of Work 2 as part of action 2.4
2016.5	Priority list of data sets for eReporting	Ongoing	Included in Annex 1 under Area of Work 2 as part of action 2.1
2017.1	Drafting of "Master Guidelines" for the INSPIRE Directive	On hold	Obsolete. Removed from WP.
2017.4	Validation and conformity testing	Proposal to close. (Completed in March 2020)	
2018.1	Streamlining the monitoring and reporting for 2019 (phase 2)	Ongoing. Proposal to close. (Completed in March 2020)	Included in Annex 1 under Area of Work 2 as part of action 2.4
2019.2	Improving accessibility of data sets through network services	Ongoing	Included in Annex 1 under Area of Work 2 as part of action 2.2
2020.1	OAPIF – OGC API Features encoding good practice	Ongoing	Included in Annex 1 under Area of Work 2 as part of action 2.2
2017.2	Alternative encodings for INSPIRE data	Proposal to close. (Completed in March 2020)	
2017.3	Improved client support for INSPIRE data	Proposal to close. (Completed in March 2020)	

ID	Title	Status in the MIWP 2016-2020	Status in the WP 2020-2024
2016.1	INSPIRE fitness for purpose – Analysis	Proposal to close after finishing the simplification of interop regulation. (Completed in June 2020)	
2016.2	Streamlining the monitoring and reporting for 2019	completed in June 2017 (phase 1); follow-up to be carried out under a new action 2018.1	
2016.3	Validation and conformity testing	completed in June 2017; follow-up to be carried out under action 2017.4	