INSPIRE Update

A technological perspective - INSPIRE Central Components

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INSPIRE
The geospatial pineapple

- One of the biggest geospatial data sharing initiatives in the world (**7000+ providers)**.

- **Multi-faceted Spatial Data Infrastructure** framework

  - **Legal**: Directive, Implementing provisions, transposition in MS.

  - **Organisational**:

    - Governance structure with National contact points / structures, Multiple Commission Services.

    - Maintenance and Implementation Work programme;

  - **Technical**: Reusing building blocks from standardisation bodies (OGC, ISO, etc.)

    - Full stack of guidelines for discoverability, metadata, data encoding and data sharing.

- **Status of implementation**

  - Directive entered into force in 2007 / Roadmap finished by December 2021.

  - **Lights and shadows**. Objectives partially achieved. Heterogeneity of implementations across EU. Pan European coverage yet do be achieved.

European Commission
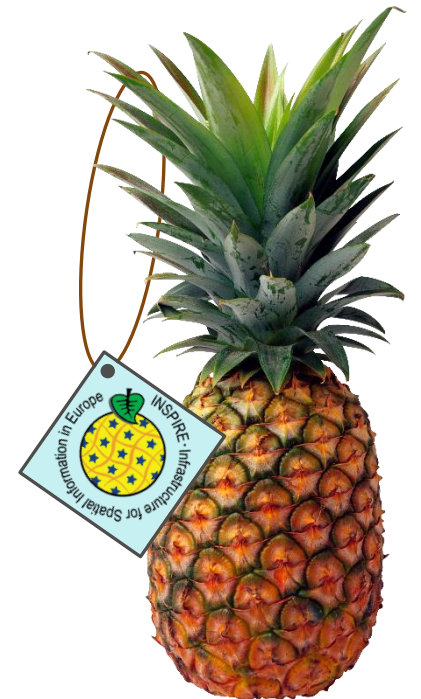
What is ahead
New Policy context

- "**Europe fit for the Digital Age**"
  - Priority of the European Commission.
- **European Strategy for Data**
  - Data Governance.
  - Digital Market.
  - Open Data Directive implementation.
  - Data Act.
- **Open Data Directive (EU) 2019/1024**
- **INSPIRE Directive** - Directive 2007/2/EC
  - Evolution: Green Deal data space.

What is ahead
Technological trends

- New data sources:
  - Internet of Things (IoT).
  - Citizen-generated geospatial data.
  - Open research data.
  - Private data.
- Novel architectures.
- Agile and "used" standards.
- Mature tools.
- Application Programming Interfaces (APIs) – From data collection to data connection.

INSPIRE Evaluation & Future
JRC Science for Policy Report

- **INSPIRE - A Public Sector Contribution to the European Green Deal Data Space**

  https://publications.jrc.ec.europa.eu/repository/handle/JRC126319

- Prepared with Geonovum and DG ENV.

- Sneak peek:
  - Overview of the status
  - Policy and technological context
  - Lessons learned
  - Vision for the technological evolution
  - Actions and roadmap
  - Prototype reference framework

JRC SCIENCE FOR POLICY REPORT

INSPIRE • A Public Sector Contribution to the European Green Deal Data Space
A vision for the technological evolution of Europe's Spatial Data Infrastructures for 2030

Alexander Kotsev, Marco Minghini, Vlado Cetl, Friso Penninga, Joeri Robbrecht, Michael Lutz

Joint Research Centre

EUR 30832 EN
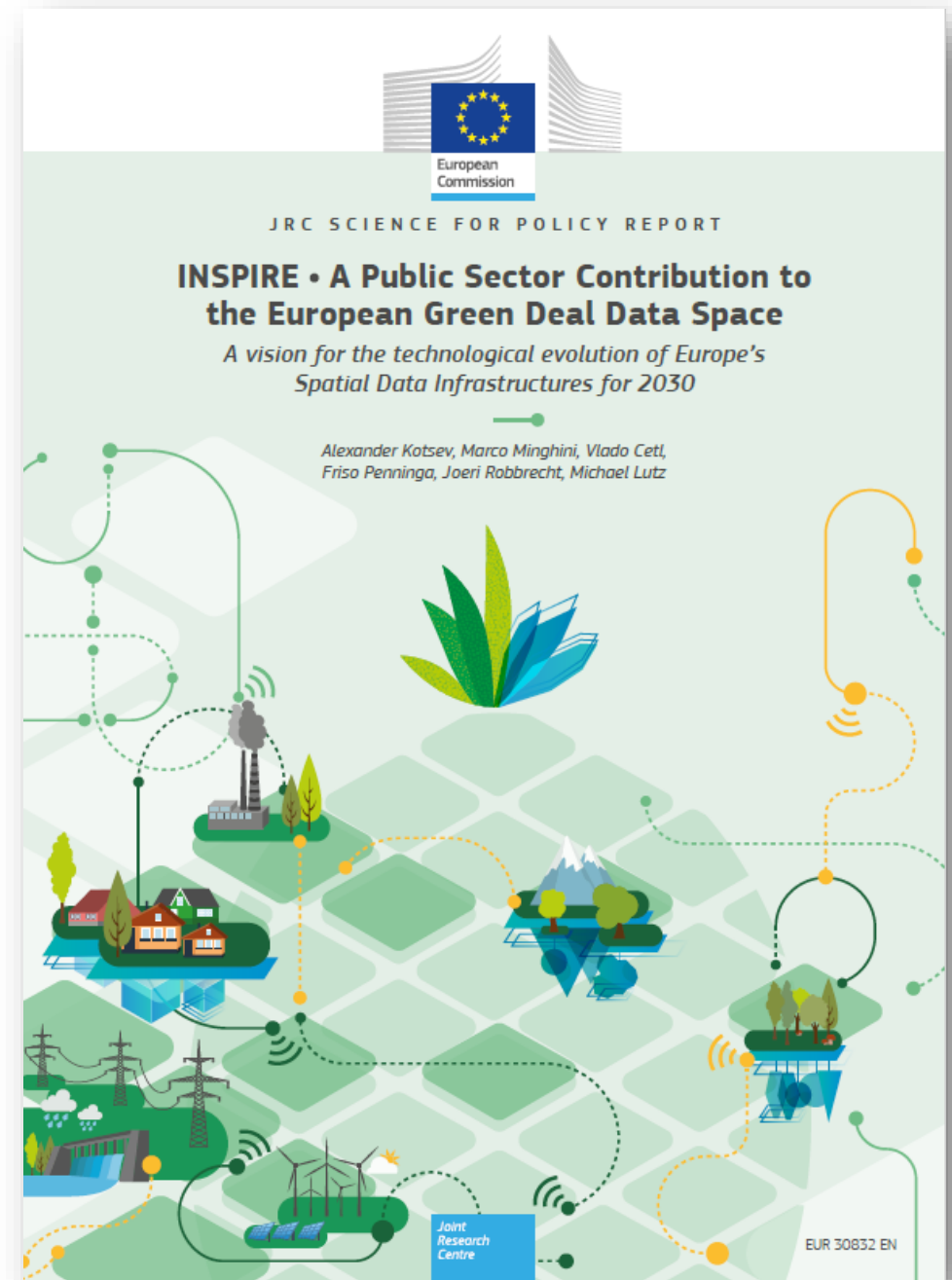
INSPIRE Future
Vision

- INSPIRE should **'blend in' with the broader ecosystem** of spatial and non-spatial data, infrastructures, technologies and policies.

- This will mean **opening up to a broader community** of implementers and users, and to a wider range of applications and use cases.

- Making the INSPIRE framework more **flexible and agile** will significantly lower the entry level to the sharing and utilisation of data.

- Technical **approaches need to be simplified** by reusing well-adopted standards and technologies.

INSPIRE Future
Sectoral European data spaces / Green Deal

Rich pool of data (varying degree of accessibility)

Free flow of data across sectors and countries

Full respect of GDPR

Horizontal framework for data governance and data access

Health	Industrial & Productive	Agriculture	Finance	Mobility	Environment Green Deal	Energy	Public Administration	Skills

- Technical tools for data pooling and sharing
- Standards & interoperability (technical, semantic)

- Sectoral Data Governance (contracts, licenses, access rights, usage rights)
- IT capacity, including cloud storage, processing and services

Personal Data Spaces

High Value Data sets

Public Sector

Addressing the challenge
Maintenance and Implementation Work programme
(MIWP 2021-2024)

Context for modernising the technological framework of INSPIRE.

6 core actions

    1.1 Towards a digital ecosystem for the environment and sustainability

    2.1 Need-driven data prioritisation

    2.2 Roadmap for priority-driven implementation

    2.3 Simplification of INSPIRE implementation

    2.4 Central infrastructure components

    3.1 GreenData4all initiative

European Commission

INSPIRE Central Components
Sustainability approach

- Support by tools is the default.

- Build strategic partnerships with communities: OSGeo, GeoNetwork

- Focus on the INSPIRE-specificity and not on mainstream tool development.

- Harmonise the approaches for helpdesk.

- Decouple tools from infrastructure.

- Extensive use of the cloud.
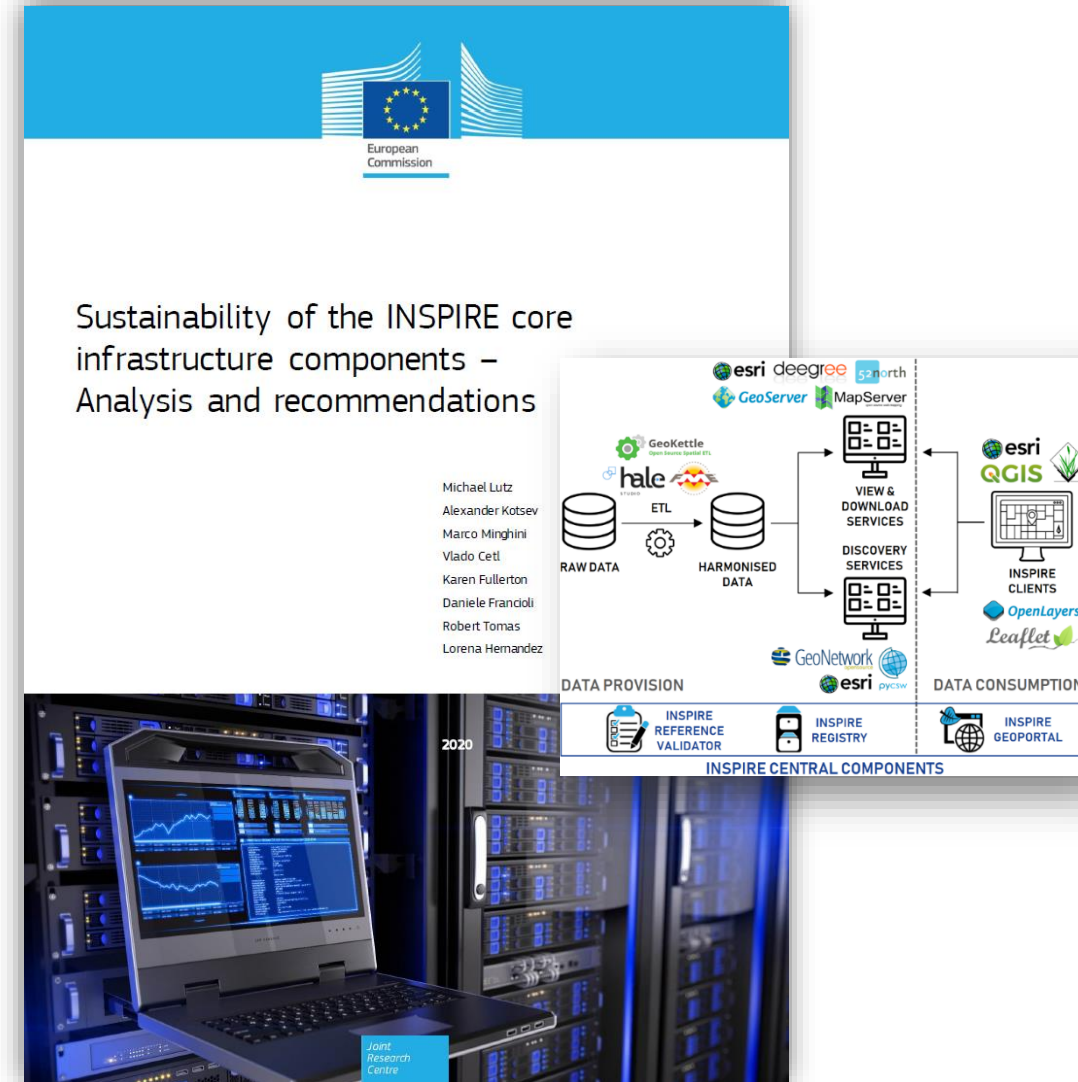
INSPIRE Central Components
Governance

- Open the floor to proposals from the community:
  - INSPIRE Helpdesks (GitHub)
  - INSPIRE Good Practices

- Transparent approach for governance:

  - MIG-T Meetings Actions and Sub-groups.

  - Decision tree and release plan:
    - Know how to approach each issue.
    - Releases planned during the year, aligned with MIG-T Meetings.
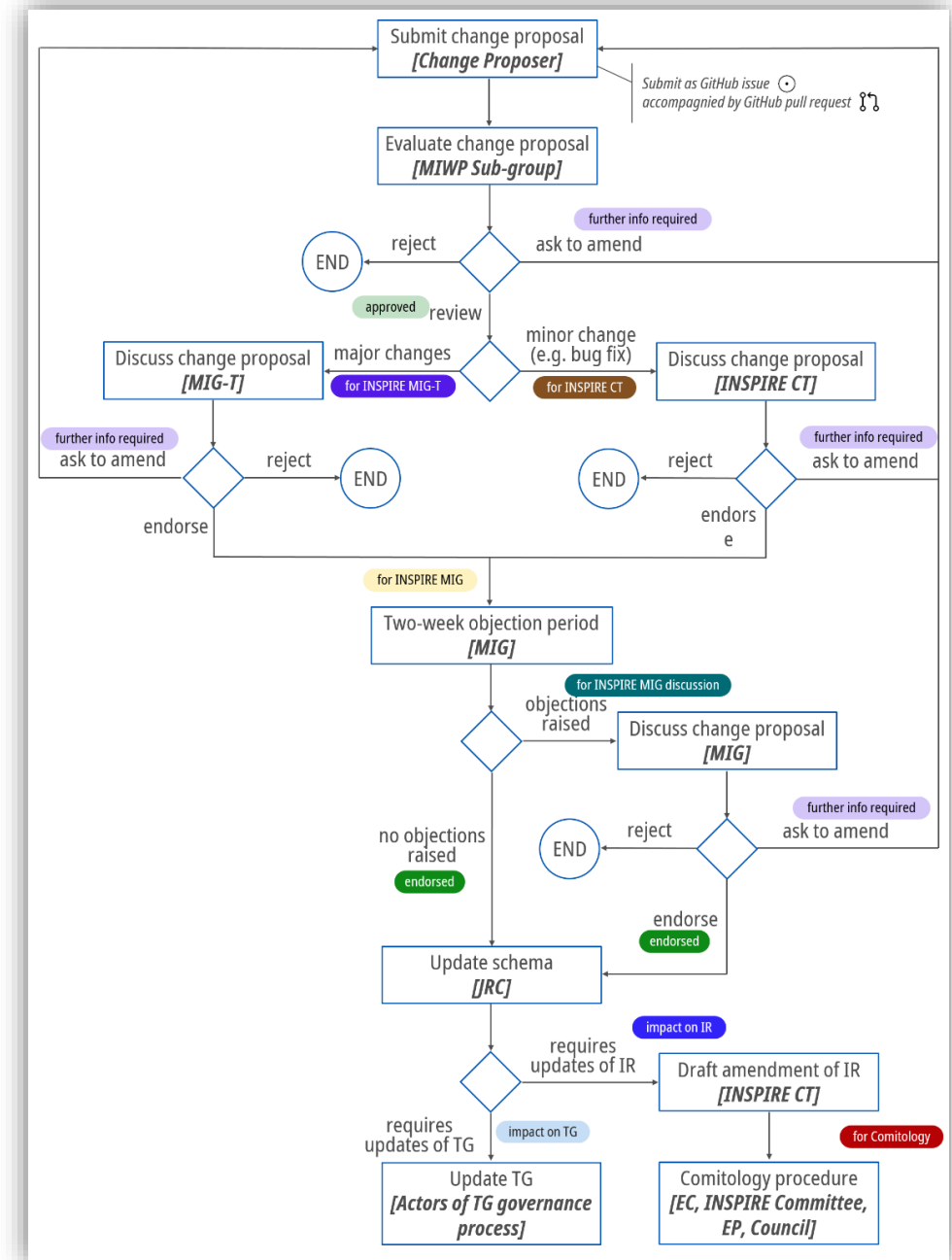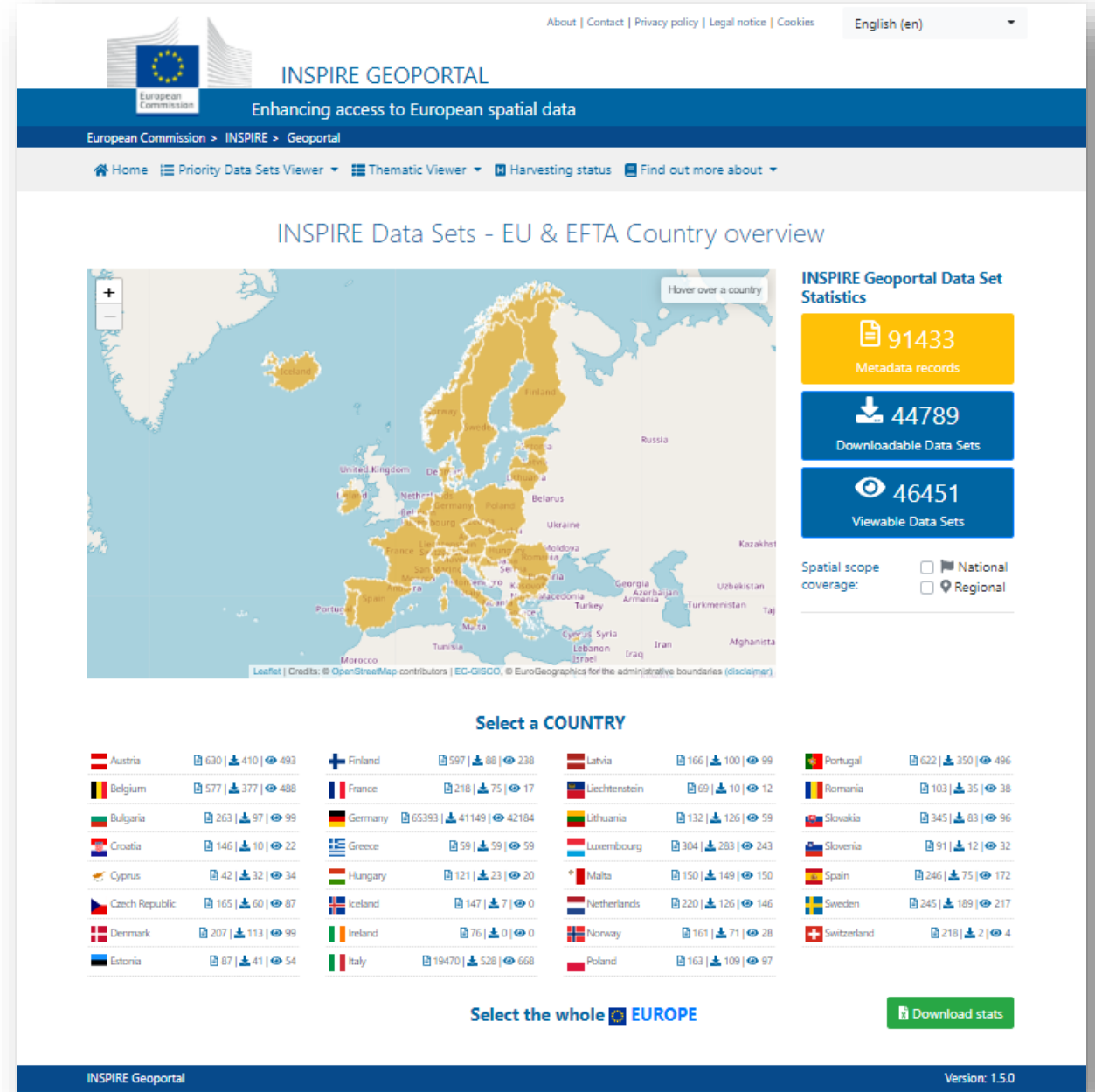
The Toolbox
INSPIRE Geoportal

https://inspire-geoportal.ec.europa.eu

Main access point to INSPIRE Infrastructure tools and resources.

- Based on own development (GeoNetwork, in near future).

- Main focus: INSPIRE M&R.

INSPIRE Geoportal
Revamp – User interface

User interface

- **Available** – Filtering by High Value Datasets (HVDs).

  To be launched when the Implementing Act on HVDs is entering into force.

- **Ongoing** – Additional developments to integrate the new user interface with the new backend: GeoNetwork.

INSPIRE Geoportal
Revamp – Backend: GeoNetwork (in the cloud)

- Prototype:

  Available and revised

- Working system:

  Delivered

  Finishing testing

Spatial data discoverability trends
Standards

OGC - API Records - https://ogcapi.ogc.org/records

- Simplification of the discovery, access and management of metadata (creation, modification and sharing) on the web.

- Data automatically discoverable through search engines.

- Status:
  - OGC API - Records - Part 1: Core - Draft specification, near to be adopted.
  - Covering read-only access to records and simple query capabilities.
  - Additional parts: covering additional capabilities addressing specific needs.

- Endorsed as INSPIRE Good Practice candidate (discovery services):
  - 69th MIG-T Meeting:
    https://wikis.ec.europa.eu/display/InspireMIG/69th+MIG-T+meeting+2022-04-01

Spatial data discoverability trends
Standards

SpatioTemporal Asset Catalogues (STAC) - https://stacspec.org

- SpatioTemporal Asset: any file that represents information about the earth captured in a certain space and time.

- STAC: Common language to describe a range of geospatial information.

- It allows data providers to expose their data as SpatioTemporal Asset Catalogs (STAC), so that new code does not need to be written whenever a new data set or API is released.

- Making it being more easily indexed and discovered.

- MIG-T community showed increasing interest on STAC.

The Toolbox
INSPIRE Registry

Tool used for referencing common codes and concepts.

Based on the Re^{3}gistry (open source) software.

https://inspire.ec.europa.eu/registry

Re3gistry software

Latest releases

- Major release (2.3.0) – 10th March 2022

  https://github.com/ec-jrc/re3gistry/releases/tag/v2.3.0

- Latest hotfix release (2.3.1) – 23rd March 2022

  https://github.com/ec-jrc/re3gistry/releases/tag/v2.3.1

Re3gistry software

Re³gistry v2 - Where to find it?

Re3gistry 2 software

license EUPL 1.2

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About the Re3gistry 2

The Re3gistry 2 is a reusable open source solution for managing and sharing "reference codes".

It provides a consistent central access point where labels and descriptions for reference codes can be easily browsed by humans and retrieved by machines.

Reference codes are exchanged between applications to uniquely reference some 'thing'. They can be used to define sets of permissible values for a data field or to provide a reference or context for the data being exchanged. Examples are enumerations, controlled vocabularies, taxonomies, thesauri or, simply, 'lists of things'.

The Re3gistry 2 supports organisations in managing and updating reference codes in a consistent way.

The Re3gistry software version numbers comply with the Semantic Versioning Specification 2.0.0.

GitHub

https://github.com/ec-jrc/re3gistry

joinup

https://joinup.ec.europa.eu/collection/are3na/solution/re3gistry/about

Re3gistry software

Who is using it?

- **Public sector**
  - European Commission, national agencies Member States, ecc.
- **Private sector**
- **Other**

- In Europe, but not just!

Re^{3}gistry v.1.3
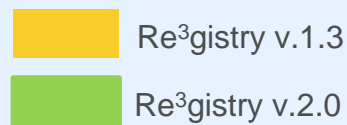
Re^{3}gistry v.2.0

0   250 500   1,000 Km

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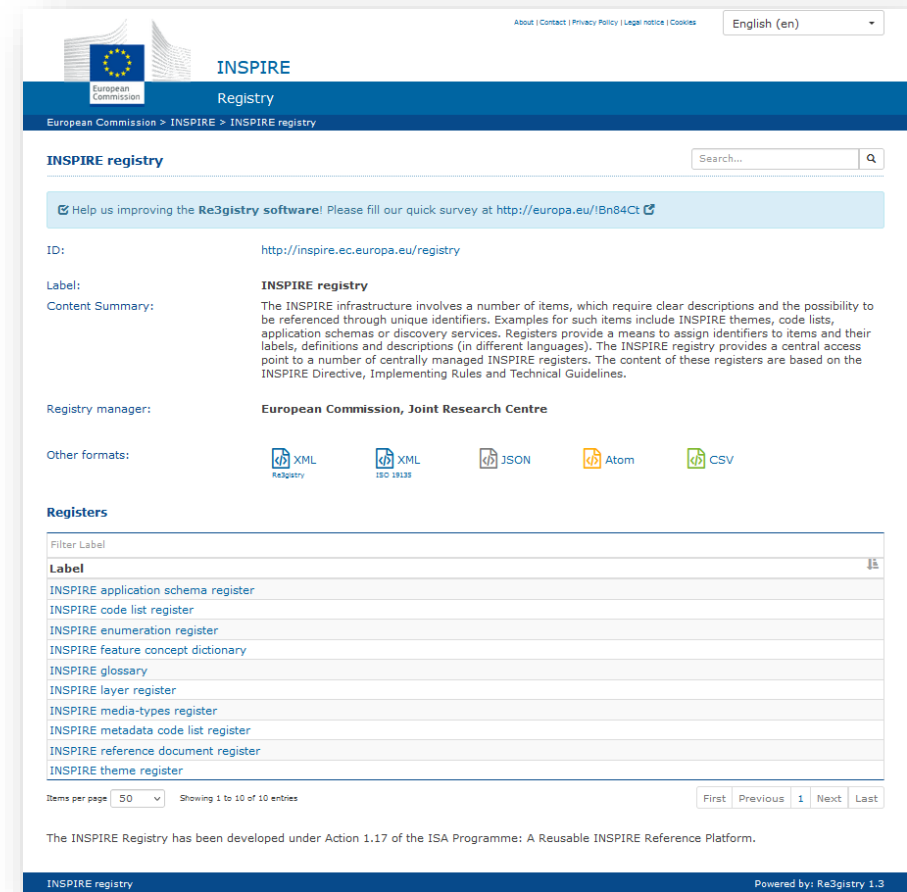
INSPIRE Registry

Software update

- Currently based on Re3gistry v1.3

- Update to Re3gistry v2

- Current status:

  - Completed: Development; Correction of bugs and new features, Testing in sandbox environment, Security assessment.

  - Ongoing: Production environment.

- Launch expected by July 2022.

Maintenance and evolution

- INSPIRE Operational Support: Re3gistry SW, Registry Federation tool and INSPIRE Registry.

- Handover to contractors in process.

https://inspire.ec.europa.eu/registry

Reuse of tools & Community building

Reuse of the tools

- Publications Office of the European Union analyzing / considering using the Re3gistry SW tool for the publication of Corporate Reference Data Sets.

Community building

- Participation in the Goolgle Summer of Code (GSoC)

  https://summerofcode.withgoogle.com

- GSoC proposals

  OSGeo Page:

  https://wiki.osgeo.org/wiki/Google_Summer_of_Code_2022_Ideas

  GitHub Re3gistry page:

  https://github.com/ec-jrc/re3gistry/wiki/Google-Summer-of-Code-2022

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Thank you!

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