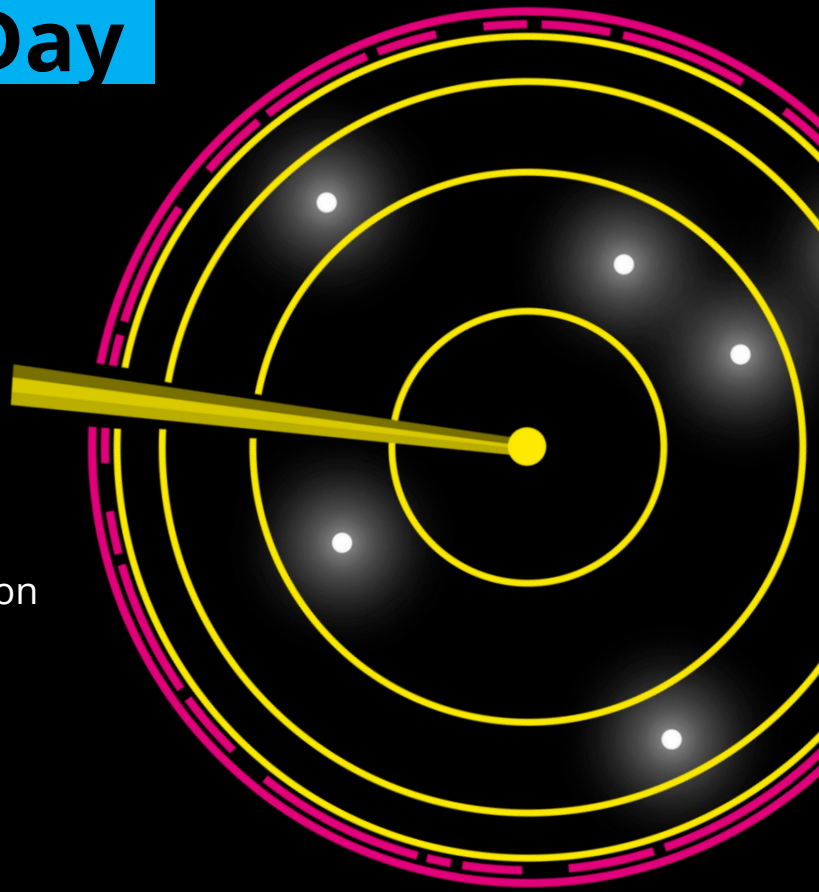
# Data Spaces Discovery Day

October 19, 2023 | Vienna



## Data spaces interoperability: Insights from the field


**Sonia Jimenez** International Dataspaces Association

**Víctor Mireles** Semantic Web Company

# Semantic Web Company (SWC) and PoolParty

**SWC is developer / vendor of PoolParty Semantic Suite**

Most complete and secure **Semantic AI platform** on the global market

**W3C** standards compliant

**ISO** 27001:2013 certified (since 2019)

**First release in**

**2009**

Current version

**9.0**

**On-premises** or **cloud-based**

Over **150** **customers world-wide**

**Integrations:** Microsoft 365, Tridion Docs & Sites, AEM, and many more

**Gartner** named SWC a Visionary in their **Magic Quadrant** for Metadata Management Systems 2019 and 2020

**KMWorld** has listed SWC as one of the **top knowledge management companies** continuously from **2016 - 2022**

**Forrester** listed SWC as sample vendor in their **report** on *The Document-Oriented Text Analytics Platforms Landscape 2022*

# DataBri-X: Data Process & Technological Bricks for expanding digital value creation in European Data Spaces

https://databri-x.eu/

## Objective of DataBri-X

provide a holistic, energy-efficient and user-friendly toolbox of practical, robust and scalable bricks/bri-X (processes, technologies and tools) that improve the interoperability, usability, discoverability, quality, and integrity of data and metadata, with the aim of making data sets ready for expanded digital value creation in the context of European Data Spaces…

3 Data Space Use Cases
- **Operator** Data Space (Athens/GR, Nova)
- **Energy** Data Space (Vienna/AT, Siemens)
- **Legal** Data Space (Munich/DE, Wolters Kluwer)

## Facts & Figures DataBri-X

- Programme: Horizon Europe (2022-2027, LINK)
- Duration: 10/2022-09/2025
- 14 Partners from across Europe
- Total Costs: 5,738,683.- EUR
- Total Funding: 4,921,992.- EUR

See facts in EC CORDIS System

**DataBri-X will develop 3 industry-specific Knowledge Graphs** including a comprehensive Vocabulary Hub for Operations/Telekom, Energy, and Legal for intra and inter DS Interoperability!

Funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union. The European Union cannot be held responsible for them.

# Interoperability Governance Model


Interoperability Governance Model (Source: European Commission, EIF 2017, p.18)

# The importance of Interoperability

**FAIR Principles**
Findability, Accessibility, **Interoperability**, and Reuse of digital assets.

The data usually need to be integrated with other data.
In addition, the data need to interoperate with applications or workflows for analysis, storage, and processing.

- (Meta)data use a formal, accessible, shared, and broadly applicable l**anguage for knowledge representation**.
- (Meta)data **use vocabularies** that follow FAIR principles
- (Meta)data include **qualified references to other (meta)data**

Source: https://www.go-fair.org/fair-principles/, accessed: 10/2023

# Interoperability in Data Spaces I (Vienna, 2022)

- IDS & GAIA-X presentation
- Lighting Talks (video)
- 4 moderated break-out sessions discussing the following topics:
- The Data Spaces approach: metadata or data (interoperability)
- (Data) Usage Control in Data Spaces
- Language and vocabularies to support Interoperability in Data Spaces
- Connecting the digital and physical world via Data Spaces





# Interoperability in Data Spaces I (Vienna, 2022)

Identified gaps and requirements for interoperability in Data Spaces

Ontologies for detailed data description

Repertoire of industry–specific vocabularies

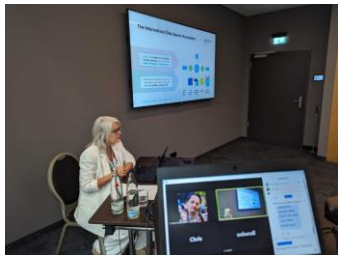
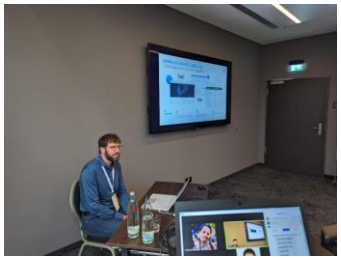
Incentives for collaboration among dataspaces / marketplaces

Refined data usage control mechanisms (purpose, right, value)

Connection between physical and digital worlds

# Interoperability in Data Spaces II (Leipzig 2023)

- 6 Position Papers and Lighting Talks
- Expert Panel on Interoperability and Standardisation
- **Phil Archer**, Director Web Solutions at GS1, formerly W3C
- **Silvia Castellvi,** Head of Research & Standardisation, IDSA
- **Edward Curry**, Professor Data Science, University of Galway
- **Felix Sasaki**, Chief Expert Knowledge Graphs, AI Unit at SAP

Workshop WEBSITE | WS on Interoperability in Data Spaces II | Leipzig, 20th of September 20223| Official SEMANTiCS 2023 workshop |

# Interoperability in Data Spaces II (Leipzig 2023)

- Two crucial factors for Interoperability & Standardisation:
  - Interdisciplinary collaboration across industries involving all relevant stakeholders
  - Centralised coordination of Interoperability developments, standardisation & implementation
- Identified more gaps and requirements for interoperability in Data Spaces
- Legal services for Data Spaces as a horizontal
- Registry of vocabularies (multilingual, industry-specific)
- Registry of policies (data usage control policies)
- These vocabs, policies etc need to be persistent & referenceable
- More comprehensive Documentation
- **(Reference) Implementations still lacking for many specifications**
- Clearly defined Governance Models

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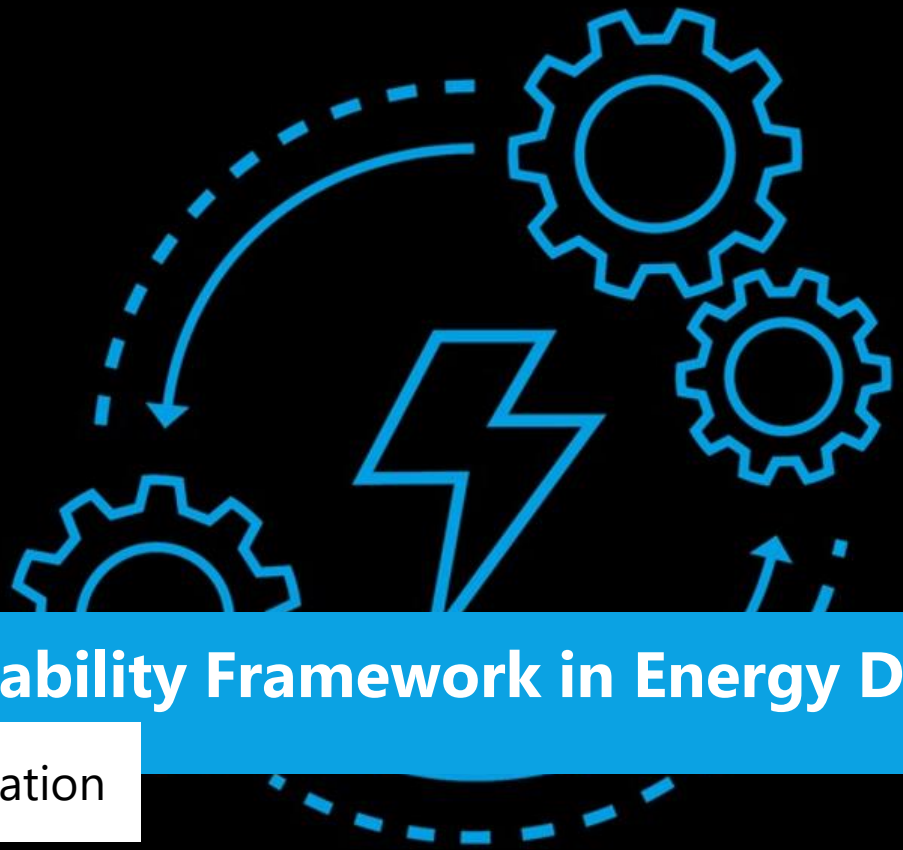

# Interoperability Framework in Energy Data Spaces

Paper presentation

# Purpose of the paper

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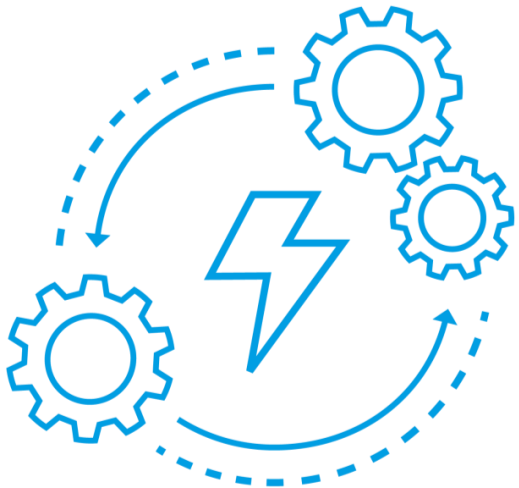
The purpose of this paper is to define a framework for achieving **technical and semantic interoperability** between data spaces in the energy domain. To accomplish this, it takes the work of the **HORIZON-CL5-2021-D3-01 projects** as its foundation, and describes the state of the art, and the challenges specific to this context.



# Paper Contributors

*Energy sister projects*

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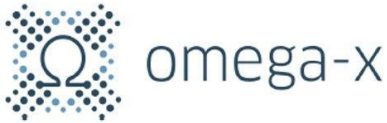
- Projects (technical) coordinators
- Semantic and technical interoperability tasks contributors from each project
- Standardization task leaders
- Pilots' coordinators





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# Relevant initiatives

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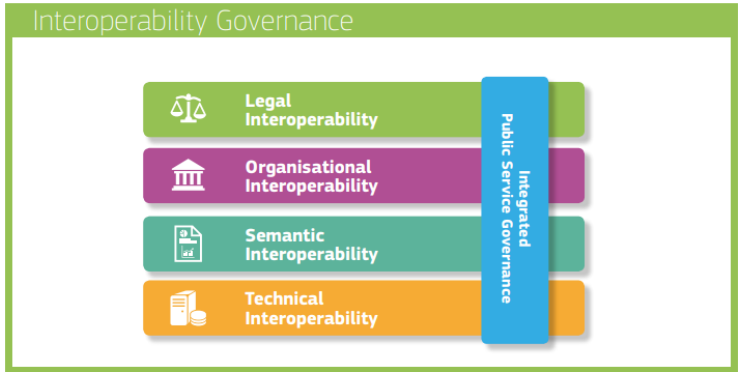
## New European Interoperability Framework

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FIWARE

gaia-x

DATA SPACES SUPPORT CENTRE

# Energy domain overview

*Requirements and challenges*

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- The energy sector is at the core of the twin **transition towards digitalization and renewable energies**
- **Fossil fuels** are increasingly being **replaced by electrification** in major sectors such as mobility, heat, and industrial processes.
- Energy is to a large extent a **regulated sector.** Non-discriminatory access to the grid and to markets is a key principle that needs to be maintained in a data space setting
- European and national regulatory bodies are imposing **rules and guidelines** that affect interactions and communications in the market. These will feed into the design and the **governance of energy data spaces.**
- Energy data spaces need to comply with a larger set of **domain-specific regulations**

# Key findings

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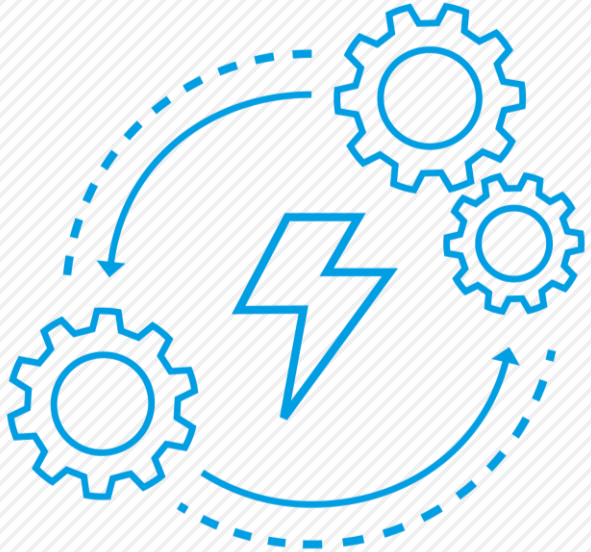
- **Standards** are fundamental to interoperate devices from different manufacturers while avoiding vendor lock-in, enhancing scalability, and ensuring data protection and cybersecurity.
- **Technical interoperability =>** for a successful federation of different data spaces, compatibility among different data connectors, services, and trust frameworks must have the highest priority.
- **Semantic interoperability =>** enormous variety of devices, assets, and applications require:
  - **Harmonization of ontologies and data models** (starting from well-established solutions as CIM).
  - **Common vocabularies and data models** can foster the benefits of federation services for cross-domain solutions.



# Next steps

- **Energy data spaces projects cluster Workshop** - November 8th in Bilbao
  - Present conclusions of paper´s first iteration
  - Define system use case to demonstrate the interoperability amongst sister projects

- **Second iteration** – November 2023 to January 2024:
  - Include projects´ current developments in Technical and Semantic interoperability
  - Describe system use case to demonstrate the interoperability amongst sister projects

- **Presentation of 2nd version to EC** in Energy data spaces projects cluster event – February 2024 (tbc)

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# Thank you!