Leveraging on energy-centered cross sector reference architectures towards an Energy Data Space

Massimo Bertoncini/Senior Innovation Manager – Digital Energy Engineering Ingegneria Informatica

Reference architecture for cross-border and cross-sector energy data exchange Webinar, 26th March 2021
BD4NRG Vision -> On the way towards a Common Energy Data Space

Open Interoperable Data-driven Reference Architecture for SG
Towards an European-level Energy Data Space within the framework of the Common European Data Spaces EC policy
Reqs and Validation compliant to GAIA-X, IDSA, FIWARE, BRIDGE,..., to design a Common Energy Data Space
BD4NRG Reference Architecture – Zooming on Data Governance & Mgmt

• Leverages and reconciles IDSA, OpenDEI, FIWARE, SGAM, BRIDGE cross-sector architecture

• Standardized data gates relying on SAREF, ETSI FIWARE Context Broker, NGSI-LD, IEC CIM

• Incorporates enforcement policies mechanisms for IDSA and GAIA-X compliant Data Access Policy Brokerage, hence enabling Data Sovereignty

• Delivering a IDSA-compliant decentralized sovereignty-preserving data access connectors for
  • Trading off data ownership vs management
  • Data access brokerage

• Hybrid Data Sharing model combining off-chain IoT data with blockchain/DLT/smart contracts for trading off speed and cost-effectiveness of a traditional distributed broker system with blockchain-based traceability
IDSA – Design Principles for Data Spaces

Data spaces

“HOW”: Soft Infrastructure

Data Owner — Data Provider — Data Consumer — Data User

Broker Service Provider — Clearing House — Service Provider

App Provider — Vocabulary Provider

Data flow — metadata flow — software flow — Core Participant Intermediary Service Provider

Ecosystem use cases and value creation

Data Spaces

Soft infrastructure

Interoperability — Trust — Data value — Governance

Interoperability: Domain data standards, standardised domain APIs, domain provenance and traceability

Trust: Sectoral unique identifiers, authorisation and access, trusted parties

Data value: Metadata & discovery services, data valuation method, data marketplace

Governance: Policy and regulations, data protection, privacy and trust

Interoperability: Data models & formats, data exchange APIs, provenance and traceability

Trust: Identity management, access & usage control policies, trusted exchange

Data value: Metadata & discovery protocol, data usage accounting, marketplace services

Governance: Overarching cooperation agreements, operational (e.g., SIAs), coexistence model
OPEN DEI cross-domain Reference Architecture Framework
OPEN DEI Referene Architecture Framework vs sector-specific projets
OPEN DEI Data-driven cross-sector building blocks

- Data standards
- Business model
- Exchange protocol
- Governance
- Identification & authentication
- Legal agreements
- Authorization
- Operational agreements
- Metadata

Source: Innopay
Leveraging on and Aligning with FIWARE Smart Grid Vertical Reference Architecture and IDSA Design Principles for Cross-sector Data Sharing Spaces
Mapping and alignment with BRIDGE cross-sector data architecture