OPENDEI

ENERGY DOMAIN

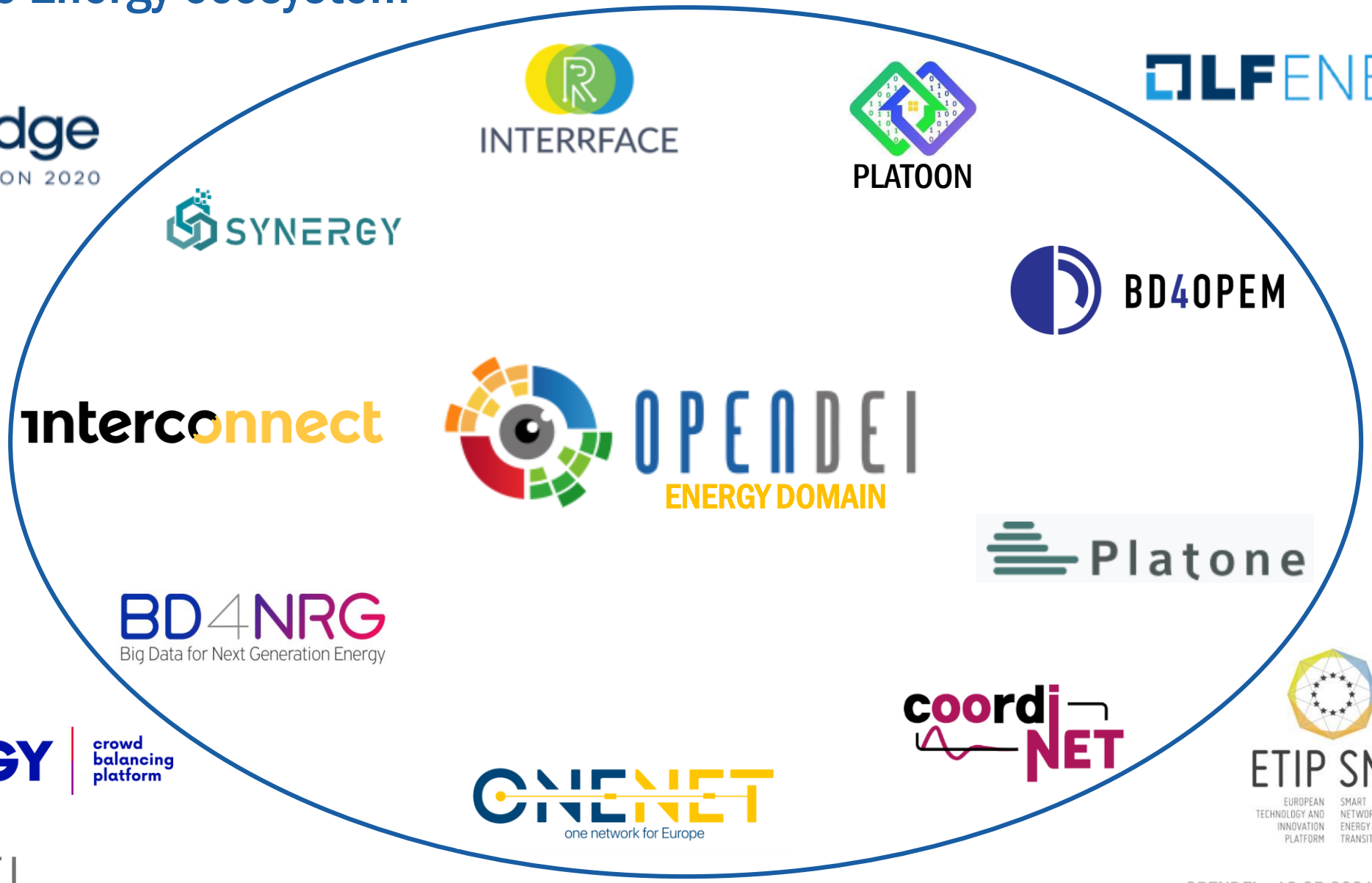
Alberto Dognini

Institute for Automation of Complex Power Systems

E.ON Energy Research Center | RWTH AACHEN UNIVERSITY

IDC 4EU LEVERAGING IDC VALUE FOR EU STAKEHOLDERS · Atos · EHTEL Collaborating for Digital Health and Care in Europe · ENGINEERING · FIWARE Open APIs for Open Minds · INTERNATIONAL DATA SPACES ASSOCIATION · innovalia ASSOCIATION · E.ON Energy Research Center | RWTH AACHEN UNIVERSITY · TECNOALIMENTI · Fondazione Politecnico di Milano

The Energy ecosystem



Use Cases Explorer

Design Thinking Methodology

Design Thinking is a formal method for **creative problem solving**, with the intent of **fostering innovation**. It is characterized by three traits: (i) the leverage of **creativity** as a driver of innovation; (ii) a **human centered perspective**, where innovators build empathy with users; (iii) and an **intense use of experimentation** as a rapid and effective source of communication and learning among stakeholders

Problem Framing

MANIFESTO:
envisioning the values provided by InterConnect

ECOSYSTEM MAP:
depicting pilot stakeholders, defining functionality, illustrating data flows

COUNTRY ANALYSIS:
investigating national contexts; learning from local peculiarities

Solution Design

USER PROFILE AND NEEDS:
identifying inspiring users; interpreting users' needs

SERVICE IDEA:
creating innovative services able to fulfill users' needs

SERVICE CONCEPT:
conceiving service journey; designing business model

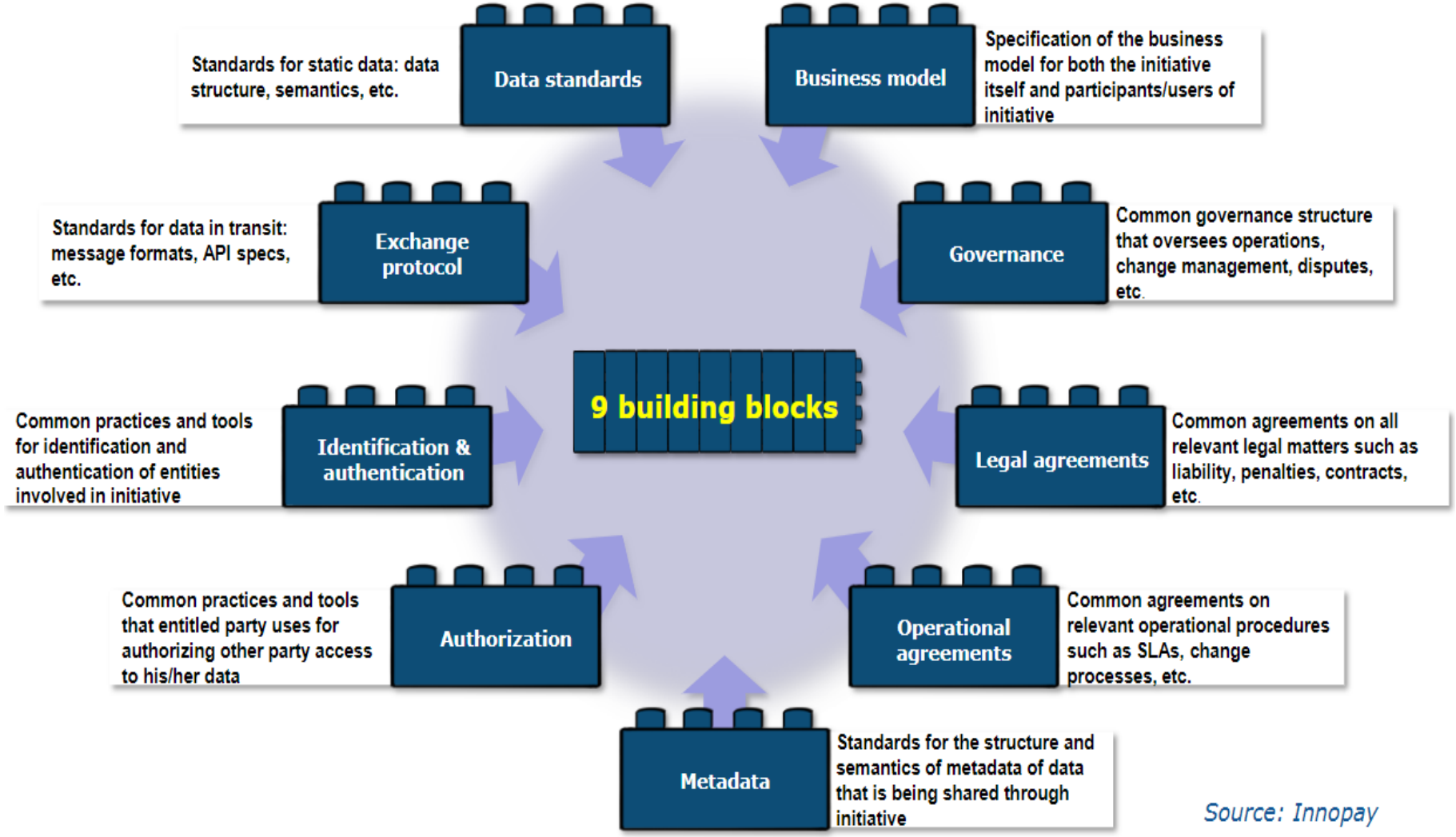
Solution Development

EPIC AND USER STORIES:
detailing service concept in epic and user stories

HIGH LEVEL USE CASE:
translating EPIC and user stories in high level use cases

Source: InterConnect H2020 Project

Data & exchange architectures: starting point



Source: Innopay

“Architectures in Data Exchange Frameworks” reference document

First Part - Architectures examples as reference:

- EEBUS – Spine
- Synchronicity – MIMs
- Platone
- Fiware – Smart Energy
- IDSA
- Gatekeeper

Second Part - Outcomes of building blocks-interviews:

	BD4OPEM			InterConnect			Platone			INTERRFACE			
Building Blocks	Yes/No	Priority	Subgroup	Yes/No	Priority	Subgroup	Yes/No	Priority	Subgroup	Yes/No	Priority	Subgroup	Summation
Business Model	Yes	2		Yes (WP1)	3	X	Yes	3	X	Yes	2		10
Governance	Yes	2		Yes	2		No			No	0		4
Legal Agreements	Under investigation			Yes	1		Yes	3		Yes	1		5
Operational Agreements	Under investigation			Yes (T2.1, T2.2)	3		No			Yes	2		5
Metadata	Yes	3		Yes (T2.4)	3		No			Yes	3		9
Authorization	Yes	3	X	Yes (T2.3)	2		Yes	2	X	Yes	3	X	10
Identification & Authentication	Yes	3		Yes (T2.3)	2		Yes	2		Yes	3		10
Exchange protocol	Yes	3		Yes (WP2)	3	X	Yes	2		Yes	3	X	11
Data Standards	Yes	3	X	Yes (T2.4)	3	X	Yes	2	X	Yes	2		10

Mapping of data exchange frameworks for projects

BUSINESS MODEL

- Implemented by InterConnect via „Design Thinking Methodology

AUTHORIZATION

- **Interrface:** Open source solutions with dynamic, service-tailored permissions
- **BD4OPEM:** Self-Soverreign Identity (SSI) and Verifiable Credentials (VC), to comply with European Self-Sovereign Identity Framework (ESSIF)
- **Platone:** based on SOGNO platform for DSO and blockchain

EXCHANGE PROTOCOL

- **InterConnect:** „Sparkle Plus Interoperability“ solution based on SAREF
- **Interrface:** “Interoperable pan-European grid service architecture“ among power system operators and customers

DATA STANDARDS

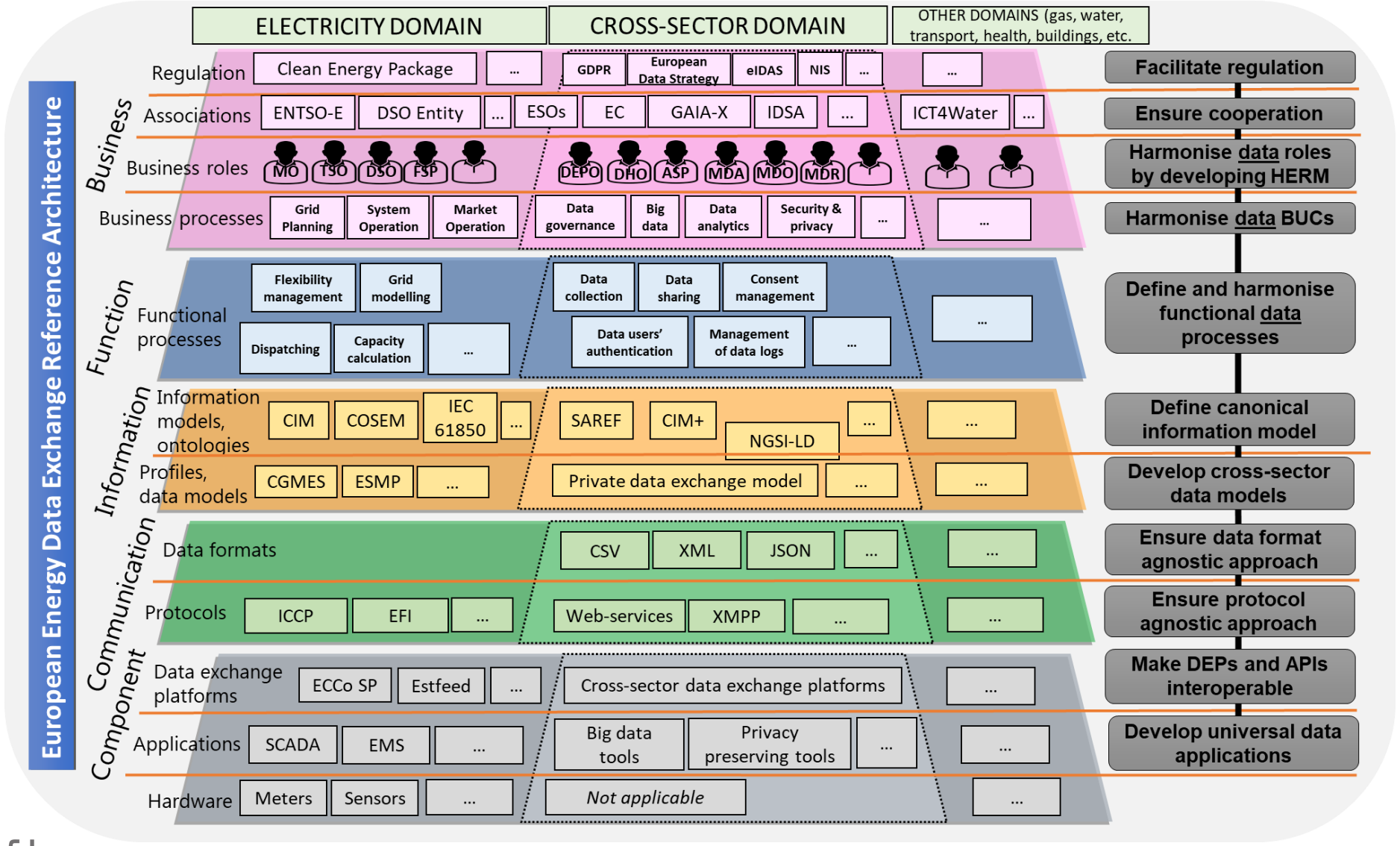
- **BD4OPEM:** harmonize the data received from the pilot sites to be used in the envisioned advanced analytics services
- **InterConnect**: “SAREFization“of interfaces for interoperability in smart home and smart buildings
- **Platone**: focus on DSO data exchange and communication among control centers

Standards & solutions

Building Blocks	BD4OPEM	InterConnect	Platone	Interrface
Business Model		Design Thinking Methodology IEC-62559 "The Ecodesign Preparatory Study on Smart Appliances (Lot 33)"	Platone main goal is not to make business on data but to define a solid P2P market model involving all the possible actors at many levels (DSOs, TSOs, customers, aggregators) using the data coming from the network.	
Authorization	Self-Sovereign Identity (SSI), in particular the Decentralized Identifiers (DIDs) of W3C with Verifiable Credentials (VC). Hyperledger Aries or uPort. eIDAS and European Self-Sovereign Identity Framework (ESSIF) - part of European Blockchain Service Infrastructure (EBSI).		Blockchain Access Layer and input from SOGNO project	Lightweight Directory Access Protocol (LDAP) Keycloak - Single Sign On (SSO) OpenID Connect (OIDC)
Exchange protocol		"Sparkle Plus Interoperability" of SPINE (related to CENELEC and EN-50631). SAREF and OpenADR.		REST API, TLS, ECCO SP IEC Common Information Model (CIM) IEC 62325 ENTSO-e "Energy Communication Platform - ECP" "Harmonised Electricity Role Model"
Data Standards	SAREF4ENER, FIWARE and (eventually) CIM	SAREF EN-50631	SCADA systems as IEC-60870-5 and IEC-61850 communication among control centers with IEC-60870-6	Propose new CIM extensions

Empty cell means that the project was not interviewed on that specific building block

BRIDGE: data reference architecture



Source: H2020-BRIDGE „Data management" working group