

Testbed for future Netzero Residential Buildings

Laurent SCHMITT

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AIOTI Signature Event

D4G, President



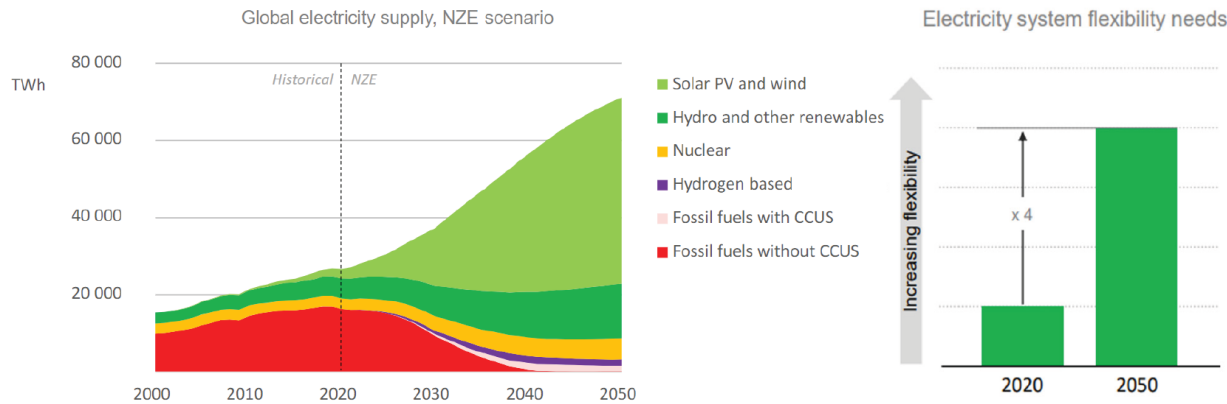
DIGITAL4GRIDS
DECARBONIZING ENERGY SYSTEMS



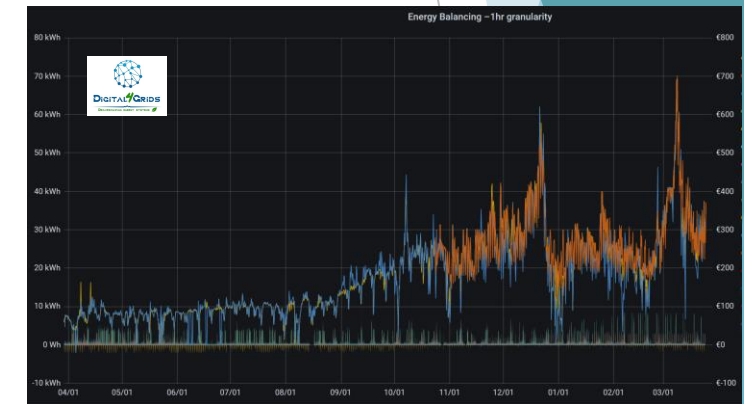
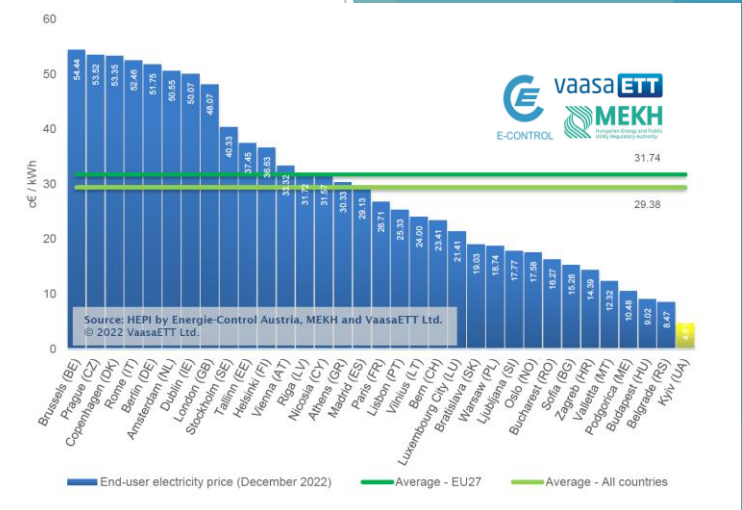
EDDIE
EUROPEAN DISTRIBUTED
DATA INFRASTRUCTURE
FOR ENERGY

The Post-Crisis Energy Paradigm Shift

Figure 11: Outlook for global electricity generation and associated flexibility needs towards a 2050 net zero trajectory



Source: Net Zero by 2050: a Pathway for the Electricity Sector, IEA May 2021



1. Significant growth expected from wind & solar capacity (x4-8 installations required/year)

2. Growing revenues from grid flexibility (x4 system flexibility needs in 2030)

3. The Ukrainian war has established new energy price references

New Prosumer post-crisis wishlist

1. Choose most relevant tariffs



*How to mitigate my energy bill increase ?
How to take advantage of energy sharing ?*

3. Take advantage of my Home IoT



How to best use my energy data ? How to further monetise my flexibility with Services Providers ?



2. Calculate Climate Impact



What is my impact to Climate Change ? How am I doing versus my community ?

4. Maximise my self generation



How to size my PV installation and best monetize my PV surplus ?



New Distributed Energy Resources integration requirements

Controllable Demand
Side Flexibility



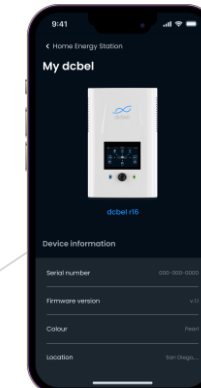
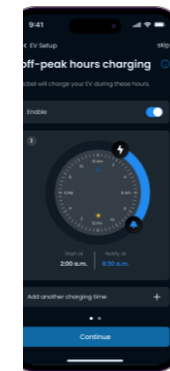
Storage devices & V2X



Residential solar self
consumption



All of them digitally connected, some
embedding edge computing & virtual
submetering

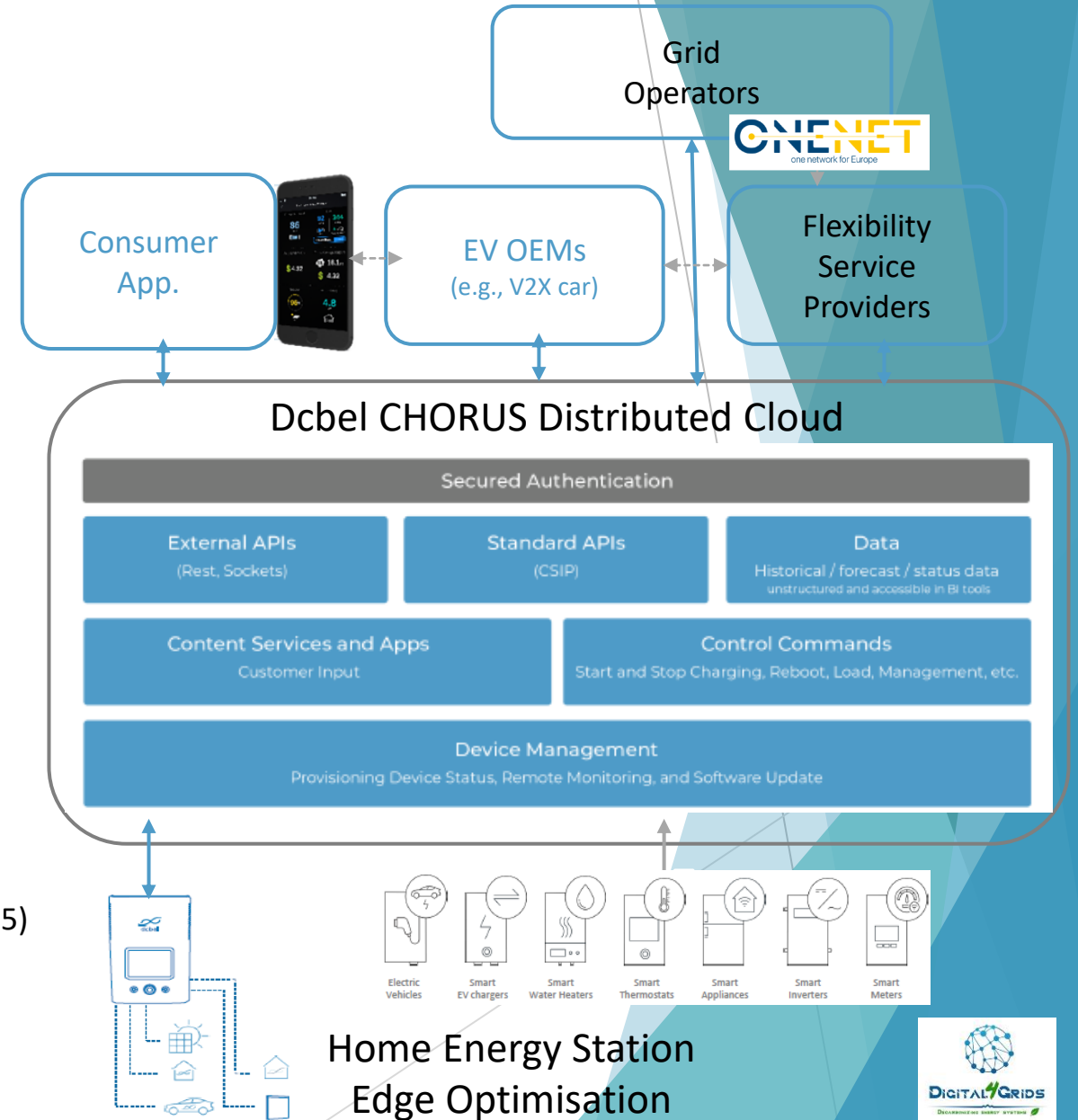


New Distributed Cloud edge continuum

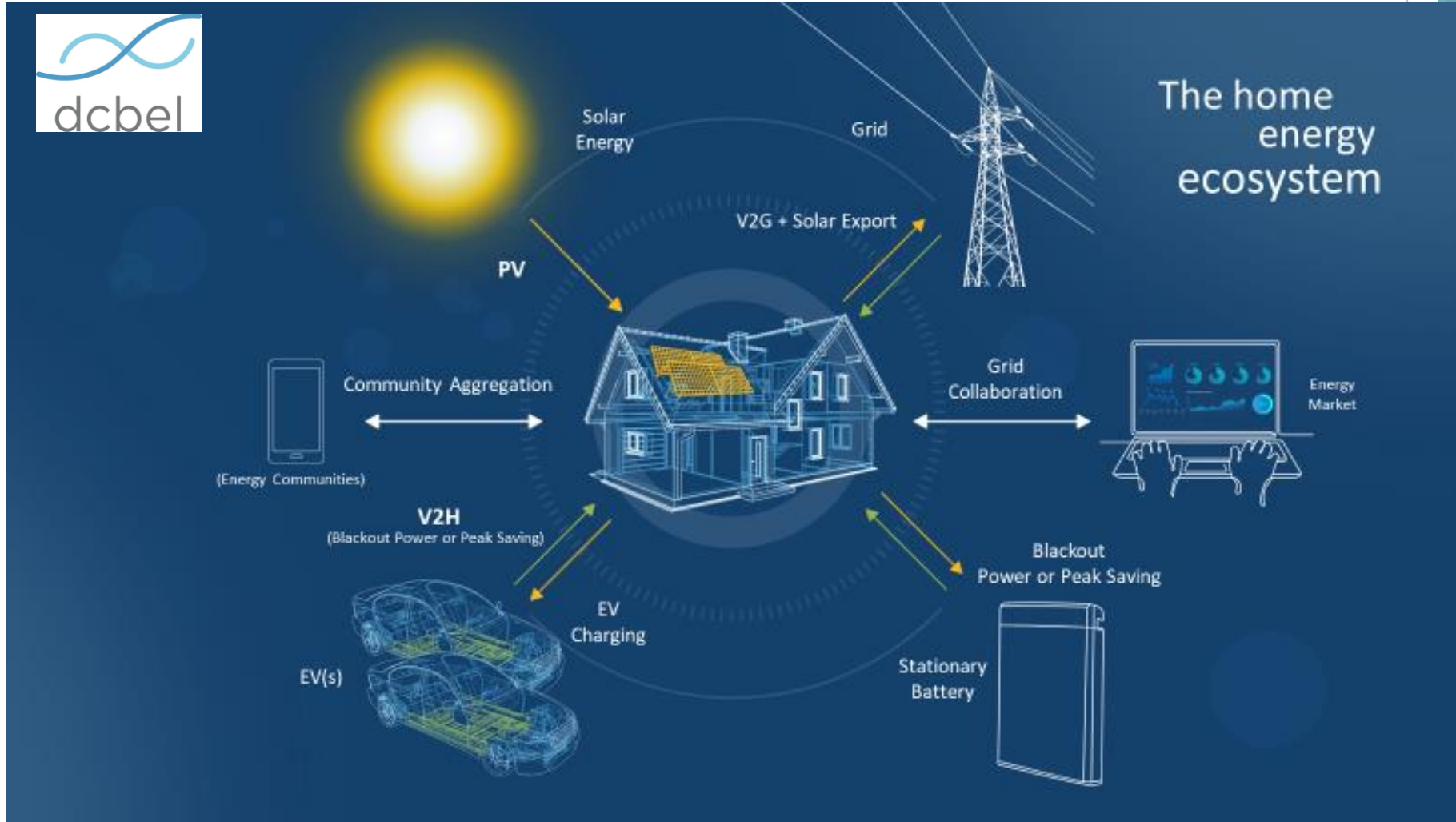


1. Standardised data interfaces for Smart Meters
2. Harmonised real-time interfaces with Grids and markets

- ✓ Designed to be scalable to million of devices
- ✓ Real-time control environment as a service
- ✓ Advanced Home energy data analytics & optimization
- ✓ Compliance to highest security standards : NERC CIP, Data Privacy Protection, TLS encryption
- ✓ Native ISO & utility interfaces compliant with applicable standards & regulation (e.g., IEEE2030.5 CSIP, IEC61968, IEC61850 Part 7, IEC62325)
- ✓ Flexible cloud to cloud interfaces to partner applications

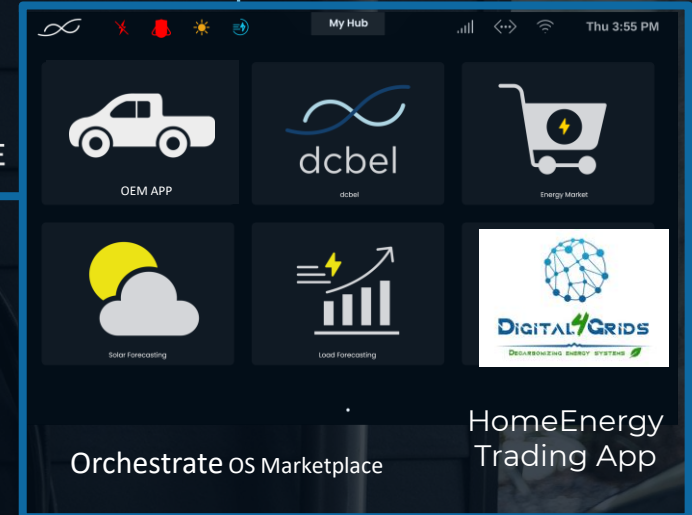
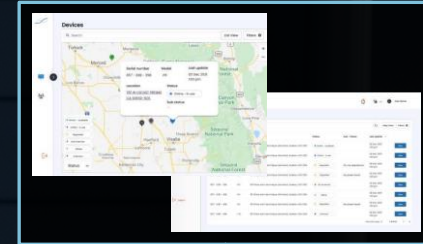


The Residential energy Netzero usecase





New **Residential Energy Marketplace**, connecting partners, aggregators, & VPPs directly to the homeowner
Edge and IoT



Open to any interested service providers

Target testbed architecture for DER flexibility

1. Pan European Dataspace for DER flexibility participation

IEC62325 data exchanges

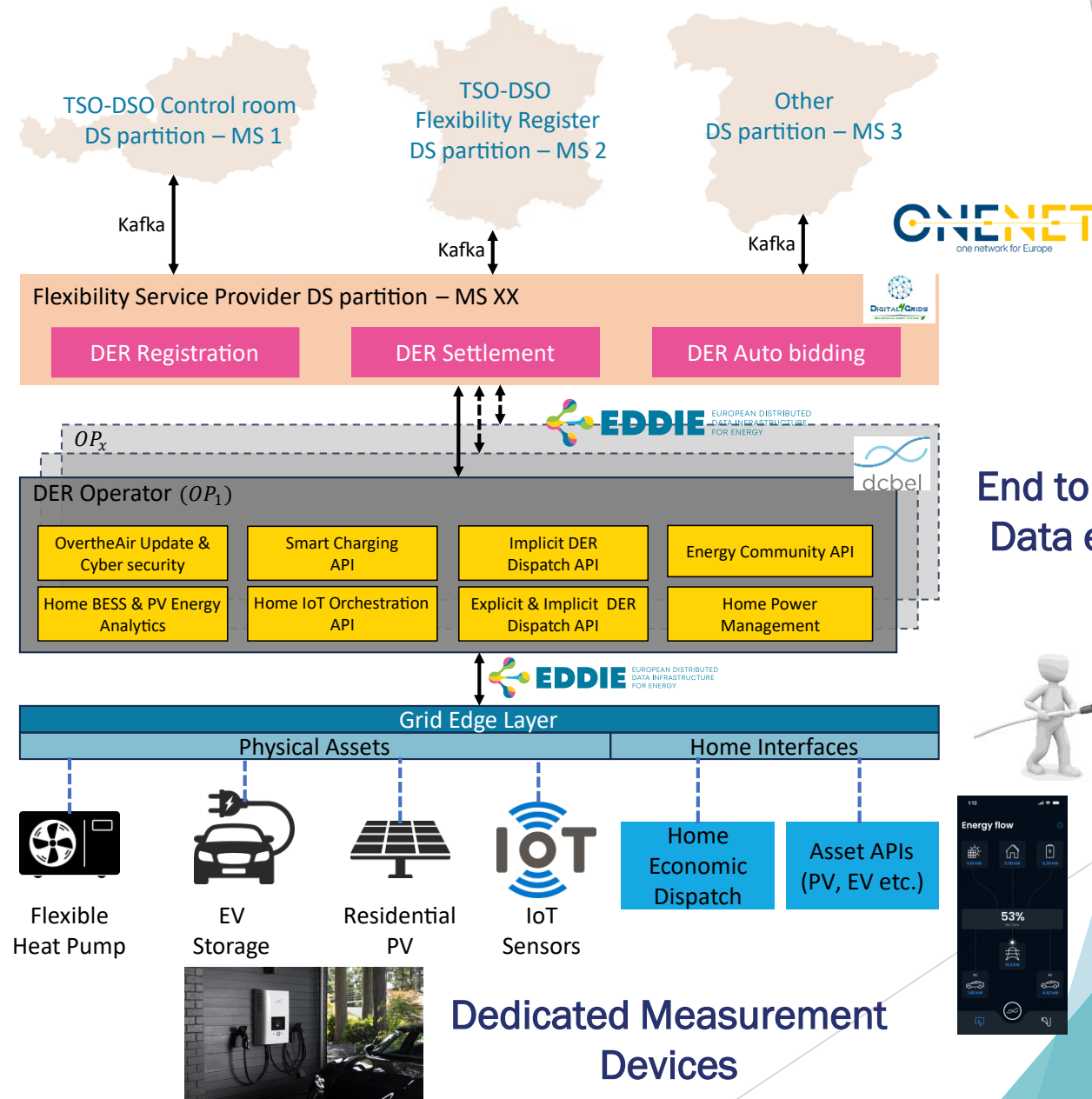
2. Pan European Dataspace for Flexibility Service Provider Interactions

IEC62746 data exchanges

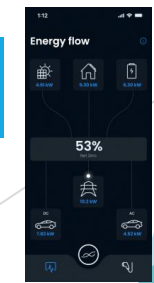
3. Pan European Dataspace for mass produced DERs & edge EMS interfaces

OEM specific data exchanges

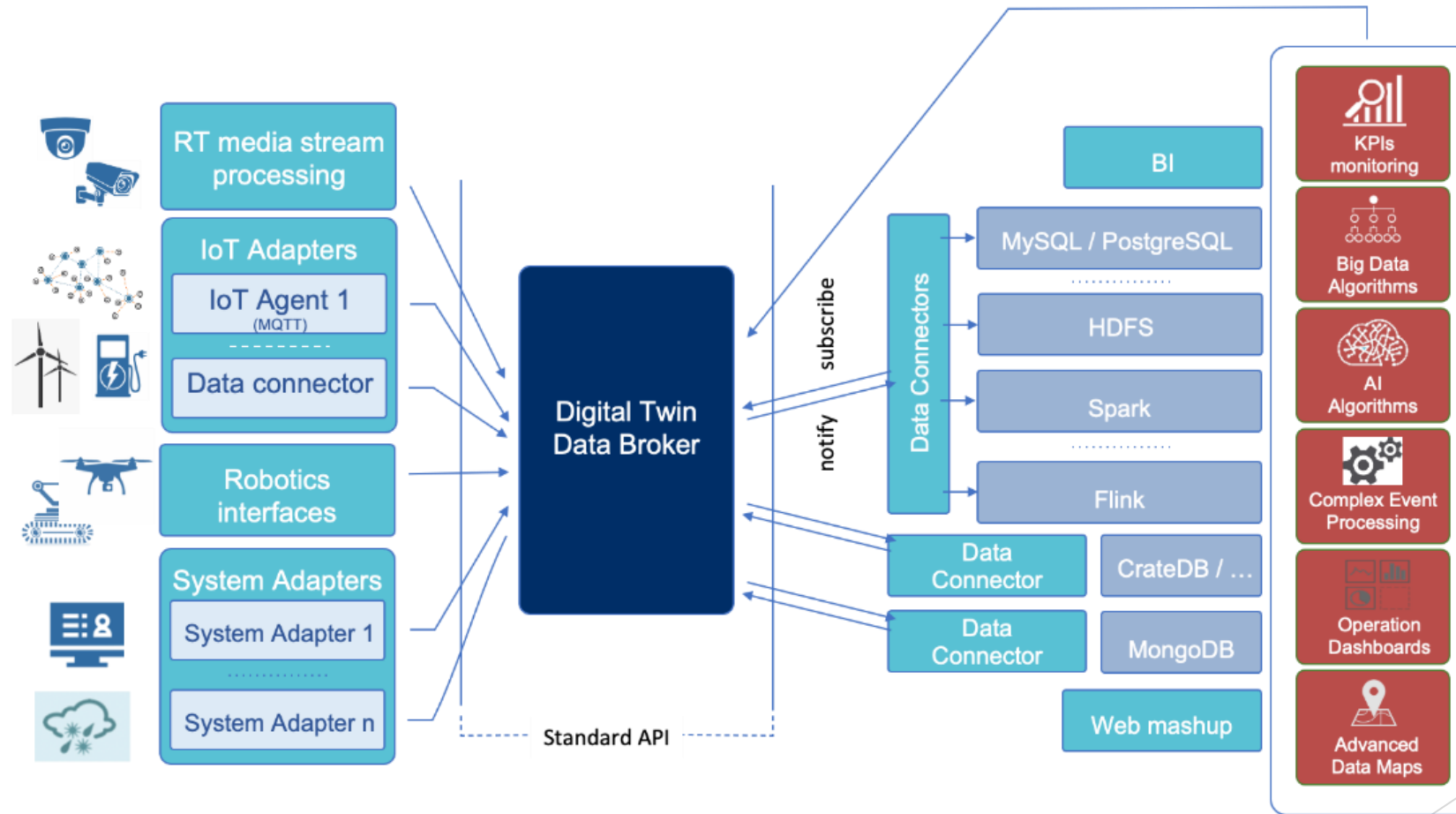
(EESBus, KNX, Matter, OCPP, IEEE2020-5/IEC61850-7, MQTT)



End to end Consent Based Data exchange platforms



Orchestrating Plug and Play DigitalTwins interactions



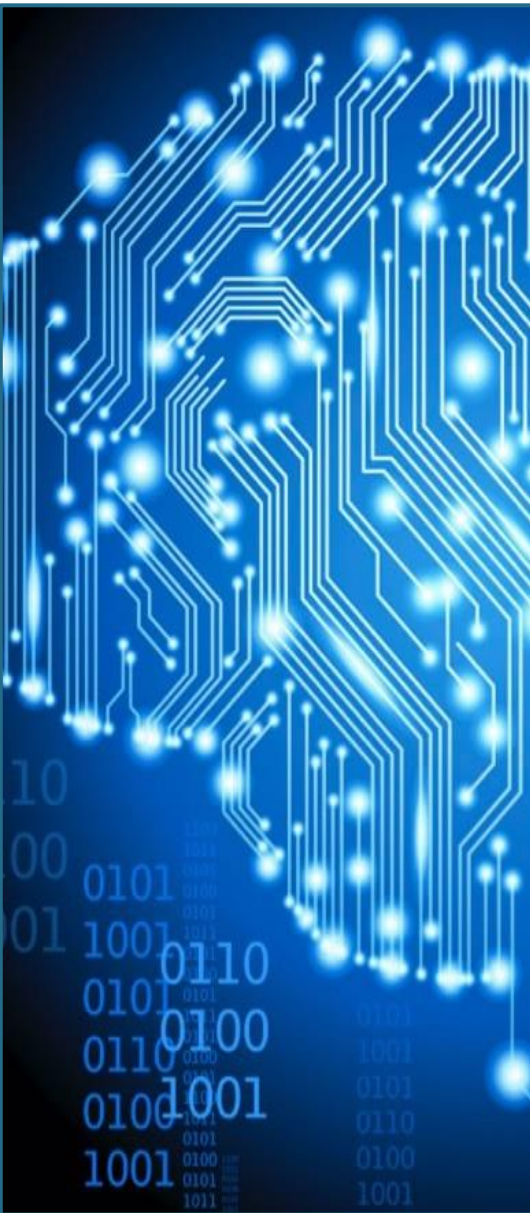
Reference Architecture for Digital Twin based Data Spaces
Source : OpenDEI Energy Domain, September 2022

Thank You

Decarbonisation



Digitisation



Decentralisation



Democratisation

