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ENLIT EUROPE – EU Project ZONE

Digitalisation of the energy system
A key challenge with a high impact on the entire energy value chain

14.00 – 15.00
29 November 2022

Moderated by Luis Cunha

Agenda

14.00 – 14.05	**Opening the session by the Moderator Luis Cunha** – ETIP SNET Vice-Chair
14.05 – 14.20	***Digitalising the energy system - EU action plan –*** Vincent Berrutto (Head of DG ENER Unit B5)
14.20 – 14.30	***The ETIP SNET past and current approach toward the Digitalisation of Energy*** - Elena Boskov Kovac – ETIP SNET WG4 Chair
14.30 – 14.40	***Future action toward digitalising the energy system - how the ETIP SNET will go to face the raised challenges by the Action Plan – with a focus on TSO and DSO cooperation point of view.*** – Luis Cunha – ETIP SNET Vice-Chair
14.40 – 14.50	**EUniversal project -** Carlos Damas Silva- REDES
14.50 – 15.00	Key final statements and conclusions
15.00	End of the session

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Opening

Luis Cunha
ETIP SNET Vice-Chair

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Digitalising the energy system - EU action plan

Vincent Berrutto

Head of DG ENER Unit B5

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EU Action Plan for the Digitalisation of the Energy System

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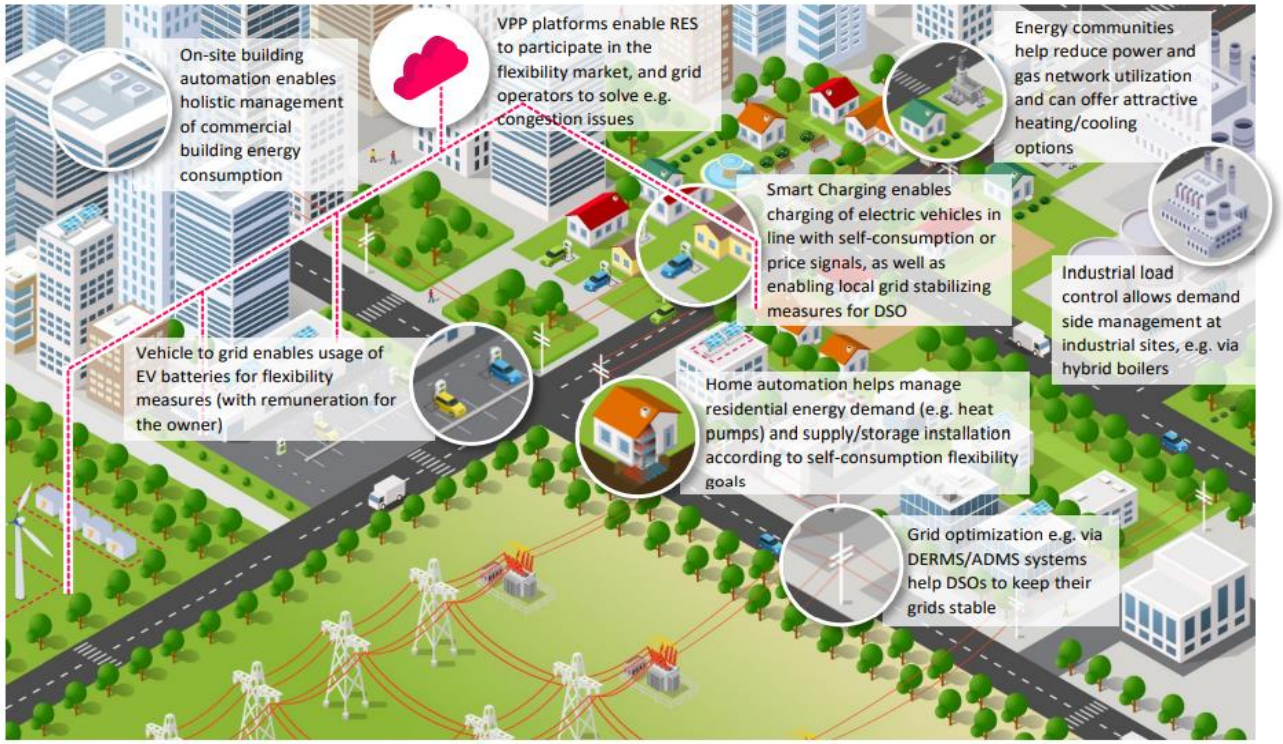
Our goal: reaping the benefits of digitalisation



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Main areas of the Digitalisation Action Plan

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A European framework for sharing data to support innovative energy services

- Priority **high-level use cases**: (a) flexibility services, (b) smart charging of electric vehicles, and (c) buildings
- Developing a **Common European Energy Data Space** (interoperable framework of common standards and practices)
- Building on the energy and digital regulatory framework, including the Implementing Acts under preparation
- Creating an EU **Smart Energy Expert Group** with a ‘Data for Energy’ working group

Increasing investments in digital energy infrastructure

- Creating a **digital twin** of the electricity grid with ENTSO-E and EU DSO Entity
- Supporting National Regulatory Authorities and ACER in defining common **smart grid indicators and objectives**
- Urging Member States to accelerate the rollout of **smart meters** and revisit their costs-benefits analysis when necessary

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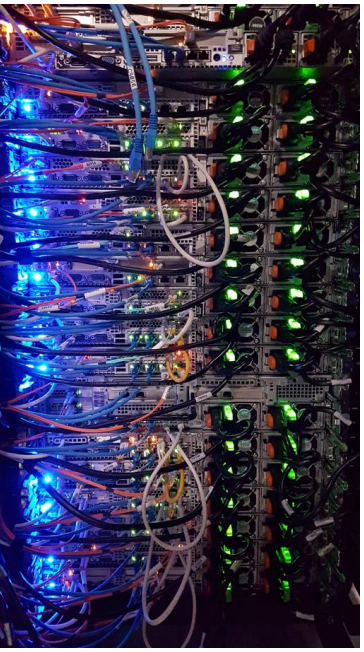
Empowering citizens

- Fitness Check of EU **consumer law on digital fairness**
- **Strategies to engage consumers** in the design and use of digital tools
- A **common reference framework for an app** helping consumers reduce their energy use, especially during peak hours
- Tools, guidance and a first-of-a-kind platform that facilitate the use of digital solutions in **energy communities**
- Large-scale partnership on the digitalisation of the energy value chain as part of the **EU's Pact for Skills**

Ensuring cybersecurity

- Complement **cross-sector legislation**, such as the NIS 2 Directive, the Cyber-resilience Act, and the proposed Council Recommendation on critical infrastructure
- With a **network code for cybersecurity aspects of cross-border electricity flows**
- And later a **delegated act on the cybersecurity of gas and hydrogen networks**

Greening the ICT sector



- **Eco-design and labelling of products**
  e.g. energy-label for computers
- Measures targeting **communication networks**
  e.g. EU code of conduct for their sustainability
- Measures targeting **Data Centres**
  e.g. environmental labelling scheme
- Measures targeting **crypto-assets**
  e.g. energy-efficiency label for blockchains

An EU-wide coordinated approach

- Increasing investments in digital solutions in **National Energy and Climate Plans, Digital Decade roadmaps, and Recovery and Resilience Plans**
- **EU funding** to accelerate the **development and deployment** of innovative digital energy solutions
- Structured **high-level dialogue** on digitalisation
- **Platform for cooperation** between digital and energy innovators
- Reinforcing **international collaboration**

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Thank you

Stay informed: https://energy.ec.europa.eu/topics/energy-system-integration/digitalisation-energy-sector_en

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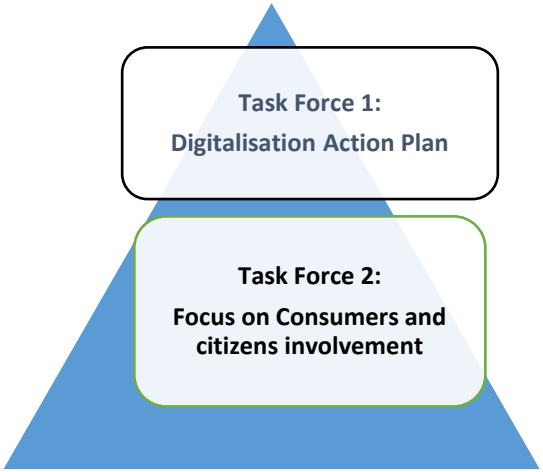
The ETIP SNET past and current approach toward the Digitalisation of Energy

Elena Boskov Kovac
ETIP SNET WG4 Chair

ETIP SNET: European Technology Innovation Platform – Smart Networks for Energy Transition and WG4

- Created by the European Commission in the framework of the SET Plan
- Brings together a multitude of stakeholders and experts from the energy sector
- Aim to guide Research & Innovation (R&I) to support Europe's energy transition towards a low carbon neutral energy.
- Objective to reflect the increasing need to consider the smart grids as an integral part of the energy system.
- It also looks at **customer participation and the impact of digalisation**
- *It identifies innovation barriers, notably related to market design, regulation, and financing.*

The ETIP SNET elaborated a Vision 2050 and two Roadmaps for R&I activities (and the associated Implementation Plans) for smart networks, storage and other sources of flexibility, and integrated energy systems, engaging all stakeholders



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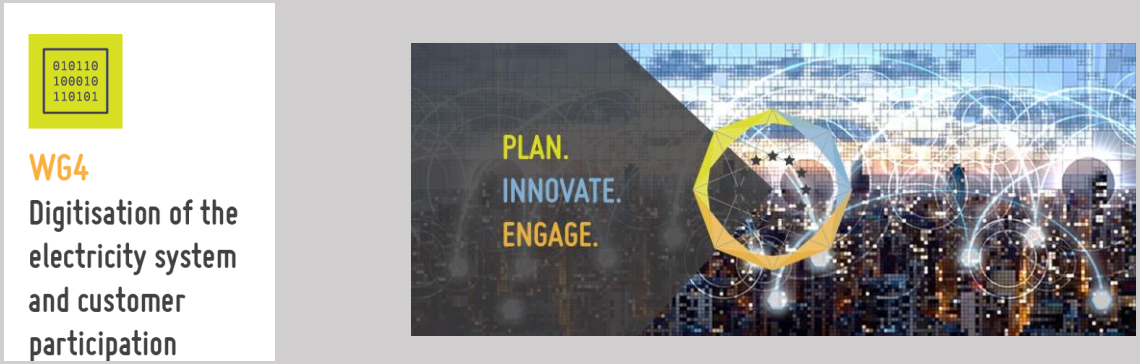
WG4 2018-21: Publications

DIGITALIZATION OF THE ELECTRICITY SYSTEM AND CUSTOMER PARTICIPATION:

- - Technical Position Paper
- - Policy Summary Paper



Big Idea 2020-21: Universal access platform(s)

- **Commercial provision of services and technology solutions** to favour flexibility, sustainable energy access (on top of the technical analysis)

ESCOs
Retailers
Aggregators

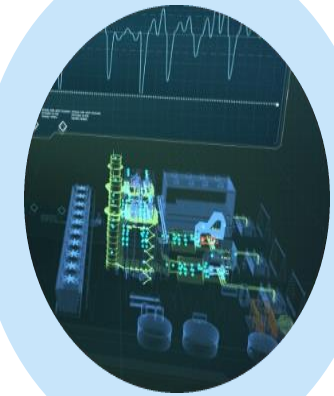
APIs

TSO

- **Joint planning**
- **Joint flexibility**

APIs

DSO
Digital Twin



APIs

APIs

«ONE STOP SHOP» Universal access platform for user-friendly energy access (Harmonized experience of EU citizen)

- **Advanced planning of the network based on accurate data**
- **Facilitating/speeding up current interactions**
- **Continuous sharing and visibility of the relevant data** and information
- **Enabling new services to all stakeholders and innovative resilience approaches** (cross sectorial activation)

APIs

Database owners (e.g. municipalities, cyber institutions, other utilities)

- **Up to date info on urban and rural mapping and cybersecure risks, weather prediction etc.**

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HLUC5: One-Stop Shop and Digital Technologies for Market Participation of Consumers (citizens) at the Centre

Starting Period	
IP 2022-2025	PPC 5.1: Value of consumer/customer acceptance and engagement
IP 2022-2025	PPC 5.2: Plug and play devices and IoT (Internet-of-things) including security by design
IP 2022-2025	PPC 5.3: Utilisation of communication networks including cyber security
IP 2022-2025	PPC 5.4: Cross-sectorial flexibility use cases
Later IP	PPC 5.4: Cross-sectorial flexibility use cases
Later IP	PPC 5.6: Creating consensus on consumer solutions

2022: Position paper on Digitalization of Energy Systems

The ETIP SNET response to consultation on the Digitalization of Energy Action Plan was submitted on **24th of January**

1. Connectivity, interoperability and seamless exchange of data

- **Need for overall covering architectures.** A major threat for successful digitalization is data management issues. While reference architectures have been proposed in the past, a complete architecture able to cover the complexity of the futuristic scenario including sector coupling is missing.
- **Need for openness.** While we need standards to support interoperability, we also need these standards to be open and accessible to everyone.
- **Need for a data economy based on open platforms.** Following on the previous point, open platforms offer rapid development solutions in a cloud environment. A proper combination of open source and proprietary solutions creates a dynamic eco-system.
- **Need for trust raising technologies.** To support a fairer access to market, digital technologies can offer important solutions enabling secure, trustful data transfer and hence automatic, transparent trade agreements and contracts. An example of such technology is given by Blockchain, but it should be reminded that it is not the unique solution.

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2022: Position paper on Digitalization of Energy Systems

2. Coordinated investments in the electricity grid supporting deployment of digital solutions

- **Need for new principles of operation.** Future energy systems will be fundamentally different and new principles of operation are needed for a future grid mostly based on digital systems. Moreover, the transformation from a load driven to a generation driven system will also call for new principles of operations.
- **Using AC versus DC.** Strictly connected to the previous point is the consideration that for a fully electronic system, the choice of using AC (Alternating Current) versus DC (Direct Current) should be fully rediscussed.
- **Need for adequate Service Management & Operations.** The digitalization of the energy system and processes leads to new business models, new revenue streams and value producing opportunities. That is, businesses in the digital energy eco-system face the challenge to set-up appropriate service management processes, systems and organizations that meet demand for superior customer service and deals with strong competition.
- **Need for adequate education.** The digital change of energy systems is not only technical but also educational. The new grid will need new competences.

2022: Position paper on Digitalization of Energy Systems

3. Customer Empowerement

- Simplification. What we discuss about the energy system does not resonate with the customers. We need to present simple stories and make the access and participation way simpler to be able to attract massive involvement. Digitalization can play a key role in simplifying processes and in giving the customers an interface they can understand. We need to mask the complexity of the energy system to increase customer participation.

- Cybersecurity at home: this is particularly critical because we cannot expect people to be fully aware of risks and solutions. As mentioned before, education in cybersecurity is needed at every level but here it is particularly critical.

- Education: this is a massive but critical action if we want to reach massive participation

- Stable and homogeneous scenarios of regulation to facilitate long-term investments

- Customers can organize themselves in Energy Communities. The role and the possibilities offered by Energy Communities should be more stressed also to incentivize local investment. Energy Communities are a key asset to bring customers in the energy systems but all the challenges related to customers apply also to Community. One more time, education is key.

2022: Position paper on Digitalization of Energy Systems

4. Cybersecurity

- AI has made tremendous progress in the last few years and it can offer great support also in cybersecurity providing innovative monitoring solutions to trace sophisticated threats efficiently.
- Another technology that is emerging more and more in the area of security is blockchain. Blockchain can provide support to address authentication, authorization, consensus, and immutability.
- Digitalization and massive deployment of sensors are making the system operation more transparent. This transparency should be used not only to improve normal operation but also to trace threats
- It is important to make the risk of cybersecurity evident to decision makers. This means that there is a need for metrics and frameworks for decision making of cybersecurity risks.
- Cybersecurity is a huge task that cannot be addressed in sylos. Stakeholders in the same sector should work closely together also exchanging data (IT, TSOs, DSOs, ESCOs, Policy)
- Regular and continuos training is vital to make our critical infrastructure resilient
- Disruptive technologies such as quantum cryptography are emerging and should be considered
- New risks are also emerging such as attacks related to robotics, autonomous vehicles, such as drones and cars.

2022: Position paper on Digitalization of Energy Systems

5. Green ICT

- Sharing infrastructure investments. Introduction of new emerging technologies such as 5G, allowing a sharing of infrastructure investment can be seen as a possible trigger for a speeding up of the Digitalization process. Furthermore, sharing the IT infrastructure means also an optimization of the energy consumption that brings an increase of efficiency.

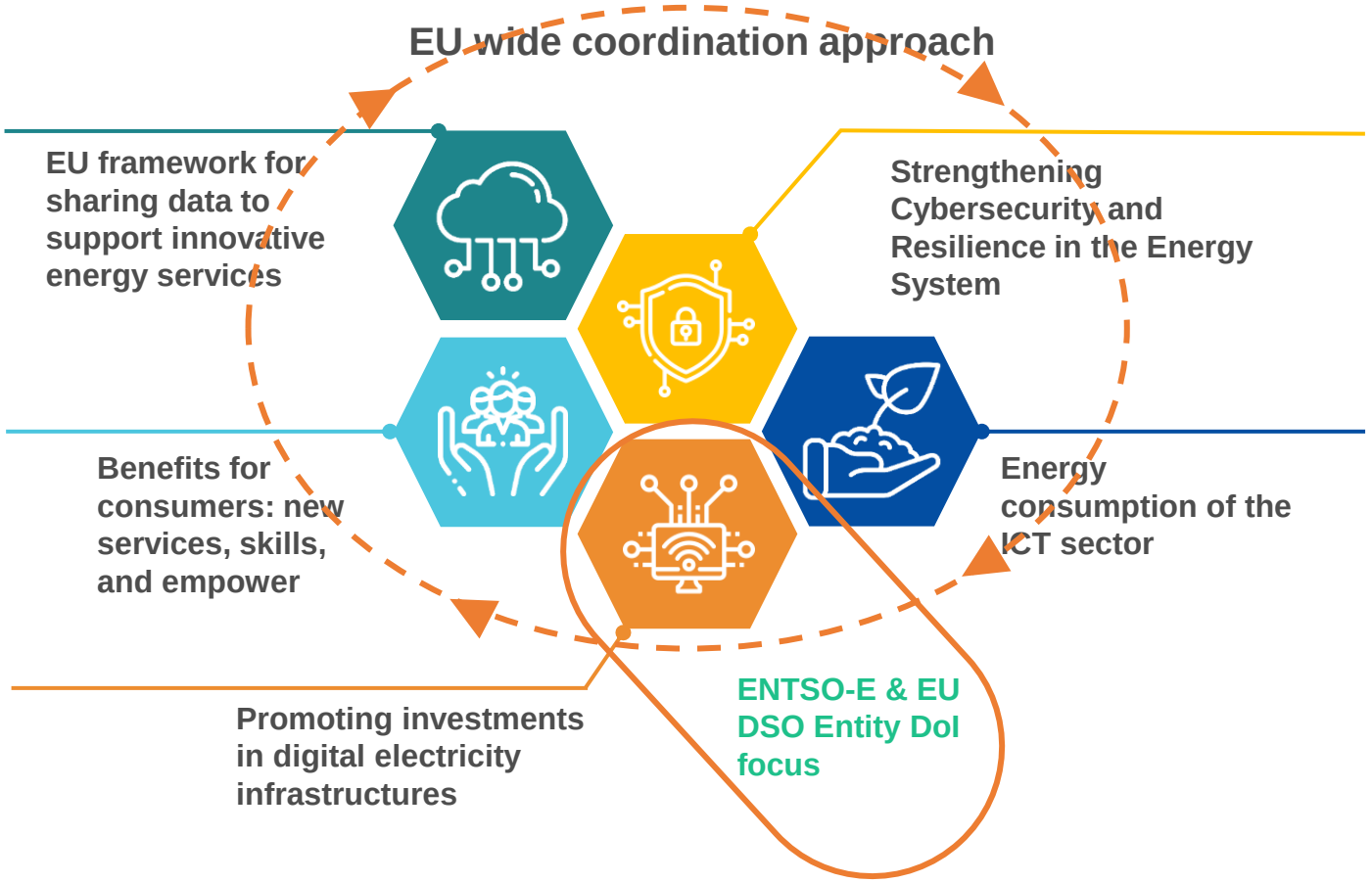
- Using existing infrastructure in the energy networks to support IT deployment. A clear example has been smart meters for electrical networks using PLC and will be in the future for many other smart grids functions using broadband power line.

- Data centers as service providers for the energy grid: an increase of efficiency for data centers can be reached also by properly integrating the computing infrastructure in the grid operation. While many of the sector coupling projects and activities target mobility or heating, the computing industry should be better integrated in this discussion to fully exploit the possibilities offered by data centers

Future action toward digitalising the energy system How the ETIP SNET will go to face the raised challenges by the Action Plan – with a focus on TSO and DSO cooperation point of view.

Luis Cunha
ETIP SNET Vice-Chair

Digitalising the energy system – cooperation between DSOs and TSOs as a first and big step forward



Link to EC Communication

Joint TSO–DSO cooperation that promotes the acceleration of investment in a smart digital electricity grid

ETIP SNET is preparing itself to respond appropriately to the challenges ahead

The current role is to guide Research, Development & Innovation (RD&I) to support Europe's energy transition: what next?

- Better linking the various initiatives together (BRIDGE; SGTF, …)
- Keeping the long- and medium-term view but acknowledging the current short-term topics and priorities
- Balancing R&D activities with industrial innovation, also involving more European industrial partners for the uptake
- Draft positions papers based on EC recommendations / demands
- Reinforcing cooperation with Member States representatives to discuss ongoing developments (e.g. better coordinating with the CETP Partnership)

One stop shop …
for the integrated energy system in front of the policy makers

ETIP SNET as service …
providing a catalogue of services to responding to short-, medium- and long-term challenges

Draft

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EUniversal project

Carlos Damas Silva
Project Manager at REDES

EUniversal

UMEI

ENLIT EUROPE 2022

E-REDES
Carlos Silva

EUniversal is coordinated by E-REDES, involving 19 partners from 8 countries

EUniversal
UMEI

DSO E-REDES, Energa operator, e·on (including: MITNETZ STROM, westenergie) + E.On Impulse GmbH as LTP)

Market/aggregator NODES, N-SIDE, centrica Business Solutions

Research Πανεπιστήμιο Κύπρου University of Cyprus, Vlerick Business School, JEN Instytut Energetyki, KU LEUVEN, INESCTEC, vito, COMILLAS Universidad Pontificia, MANCHESTER 1824 The University of Manchester

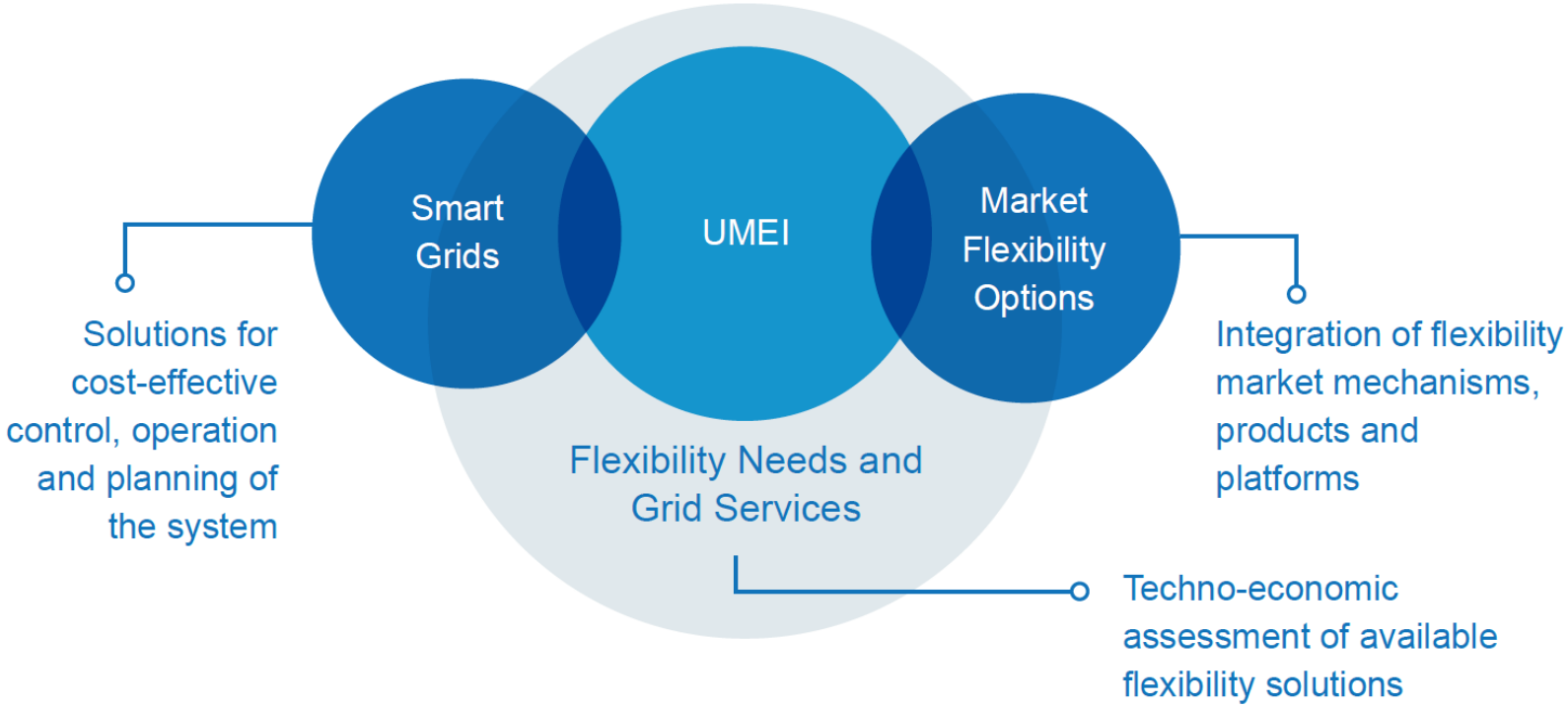
Association E.DSO, EASE European Association for Storage of Energy

Solution provider SYSTEMY AUTOMATYKI, MIKRONIKA, ENGIE Impact

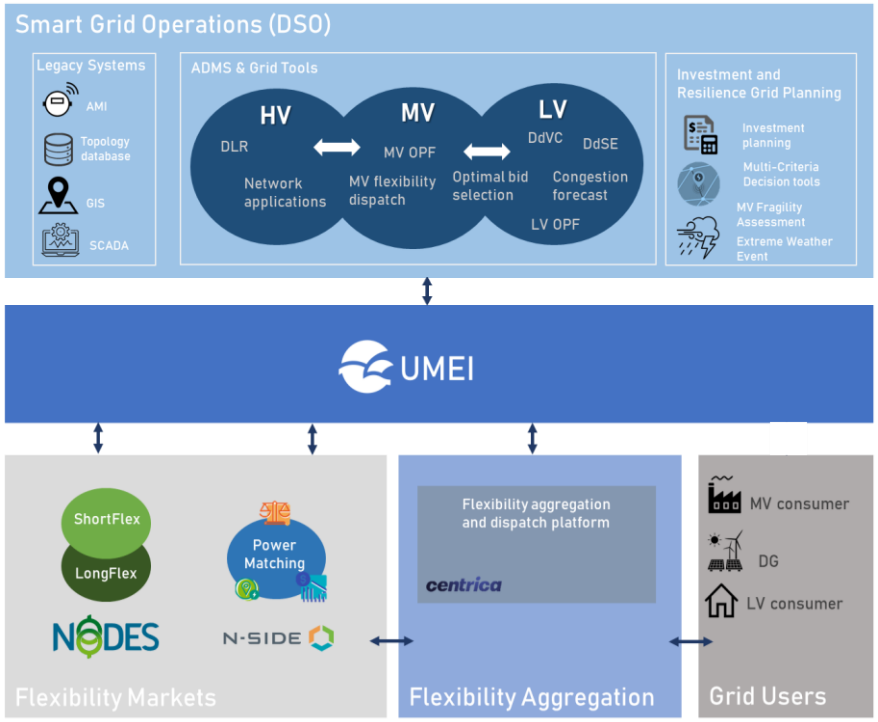
Consulting zabala innovation consulting

Universal Market-Enabling Interface

A three-fold approach lays down the foundation for this implementation

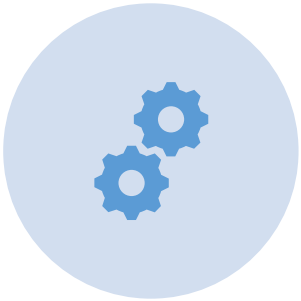


The UMEI: universal, adaptable and interoperable



- Not a platform
- A set of open rules (API specification)
- Available for any system and market operators
- Being tested in 3 locations
  - 3 DSO, 2 FMO, 1 FSP
- Available on
  - euniversal.eu/the-umei
  - github.com/euniversal/umei-api-specification

Contribution to the Digitalisation of the Sector



NEW TOOLS TO ENABLE NEW SERVICES AND IMPROVE SYSTEM OPERATION

OPEN AND COMMON RULES FOR DATA EXCHANGE AND FLEXIBILITY SERVICES

CONSUMER EMPOWERMENT, INNOVATION, AND EUROPEAN INDUSTRY COMPETITIVENESS

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Let's flatten the energy curve!

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