



FLEXCoop

Aggregator: Focusing on Citizen Empowerment

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The FLEXCoop project



THE PROBLEM ?

Small consumers excluded from energy markets

- Lack of smart / **real-time metering**
- **Regulatory** framework in most EU Countries
- **Non-viable market** offerings for small consumers

THE NEED

- Make prosumers understand their flexibility
- **Aggregation** / overcome minimum sizing of bids
- **Fair contractual** relationships with aggregators
- Highly effective **automated DR** strategies



THE FLEXCoop SOLUTION

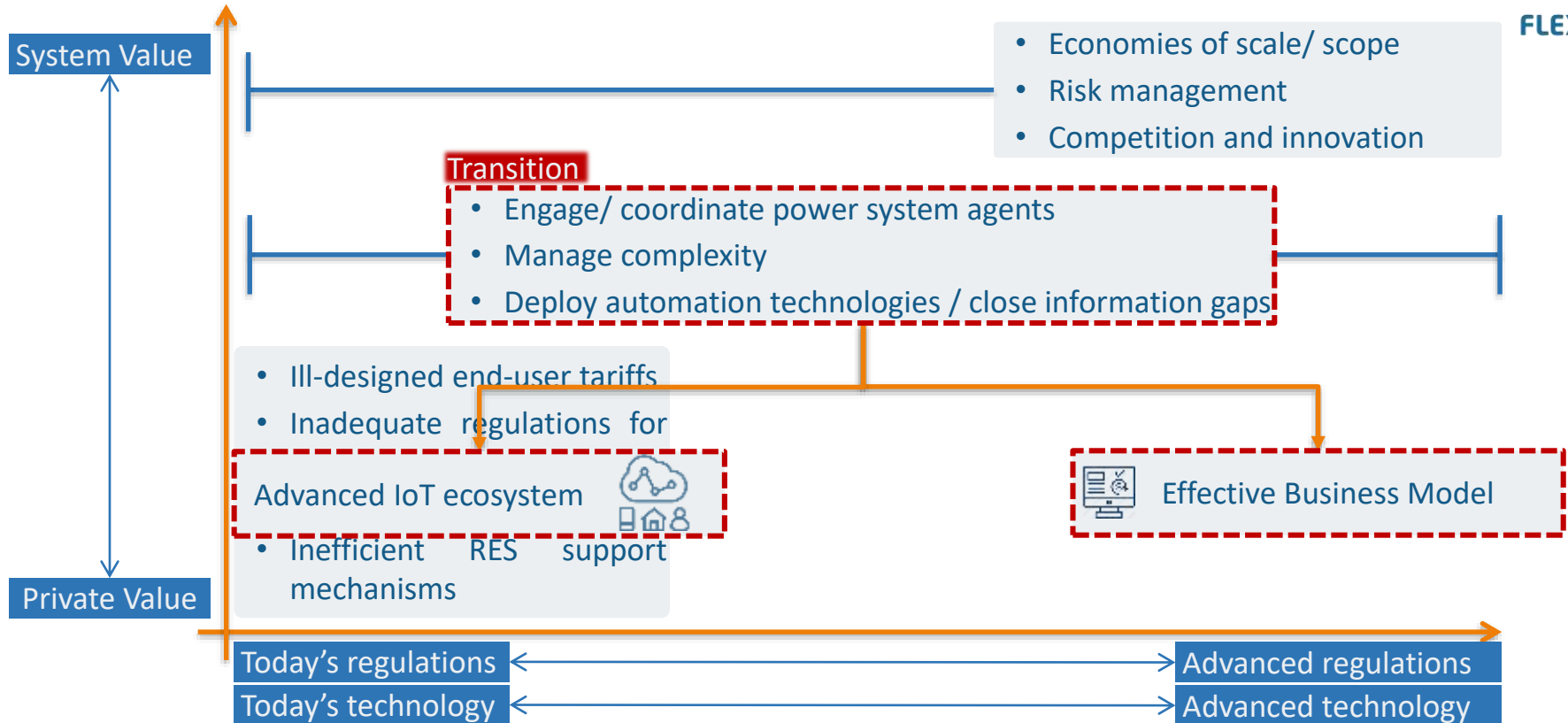
- **Cooperatives** as aggregators / New business model
- **End-to-end automated DR** optimization framework
- Flexibility based on low-level metering / ambience sensing/ **human-centric approach**
- **Dynamic** Virtual Power Plant creation

Current vs future status / Bridging the gap



FLEXCoop

*The value of aggregators in Electricity systems, S. Burger et al., MIT CEEPR, 2016



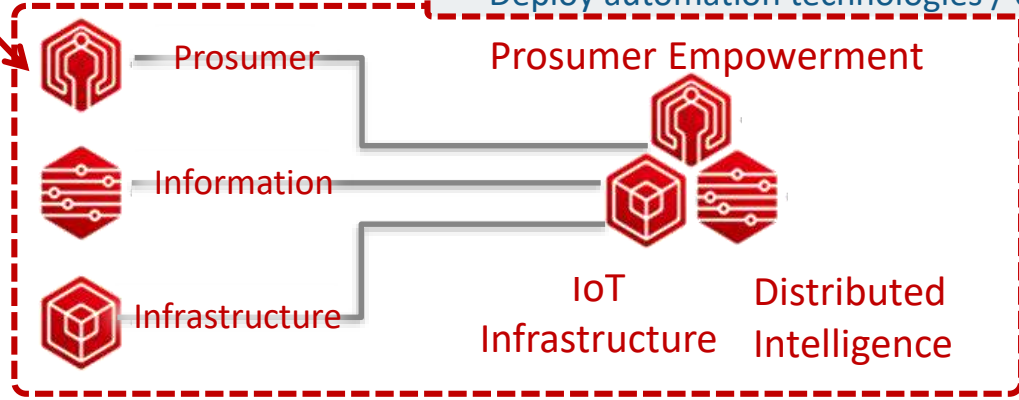
PUT PROSUMER AT THE CENTRE

Transition

Human-Centric Innovation

- Engage/ coordinate power system agents
- Manage complexity
- Deploy automation technologies / close information gaps

Prosumer Empowerment





Transition

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PUT PROSUMER AT THE CENTRE

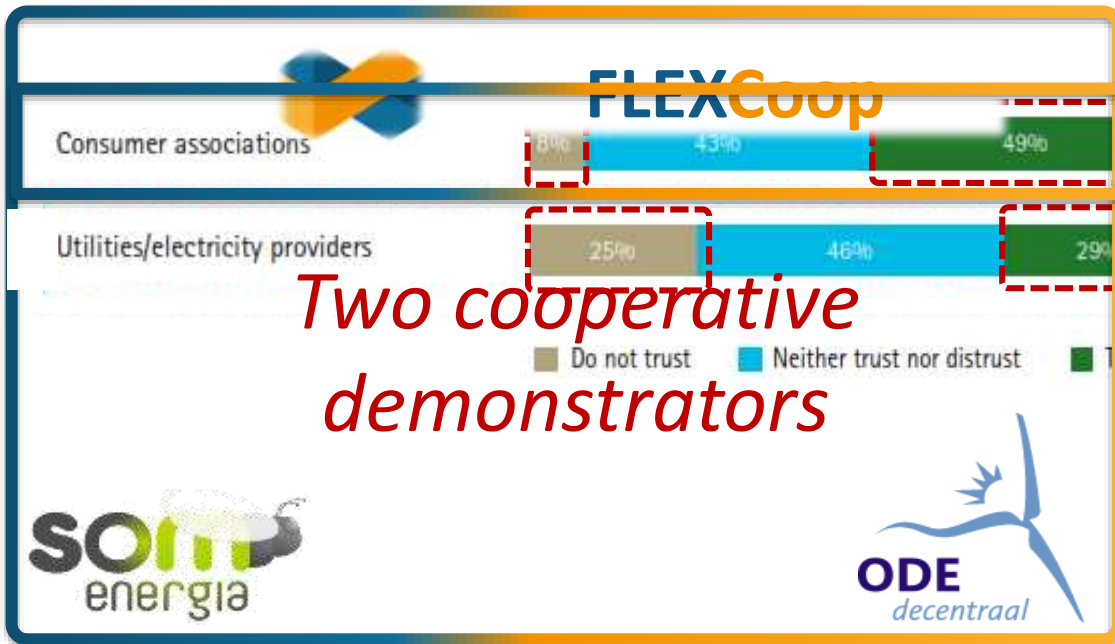
FLEXCoop Cooperative as aggregator



RESCoop business models*

- Local group of citizens
- Regional RESCoop
- Fully integrated RESCoop
- Network of RESCoops
- Multi-stakeholder governance
- Non-energy-focused





Rapid proliferation of energy cooperatives around EU



Regulation favours collective schemes

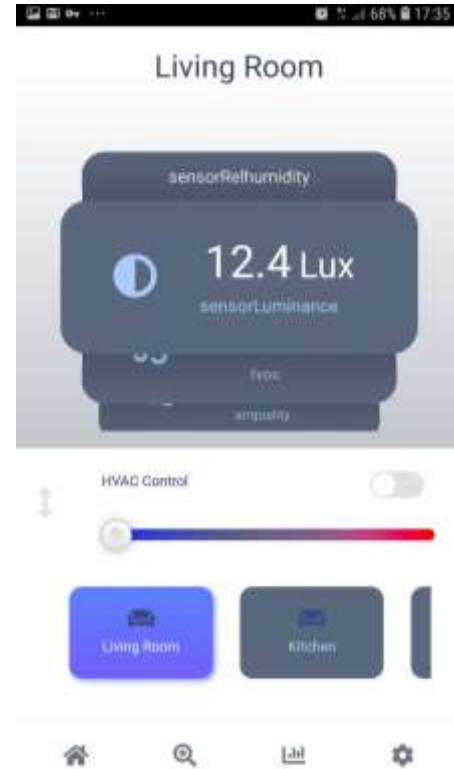


Cooperative **members** are already **sensitized**



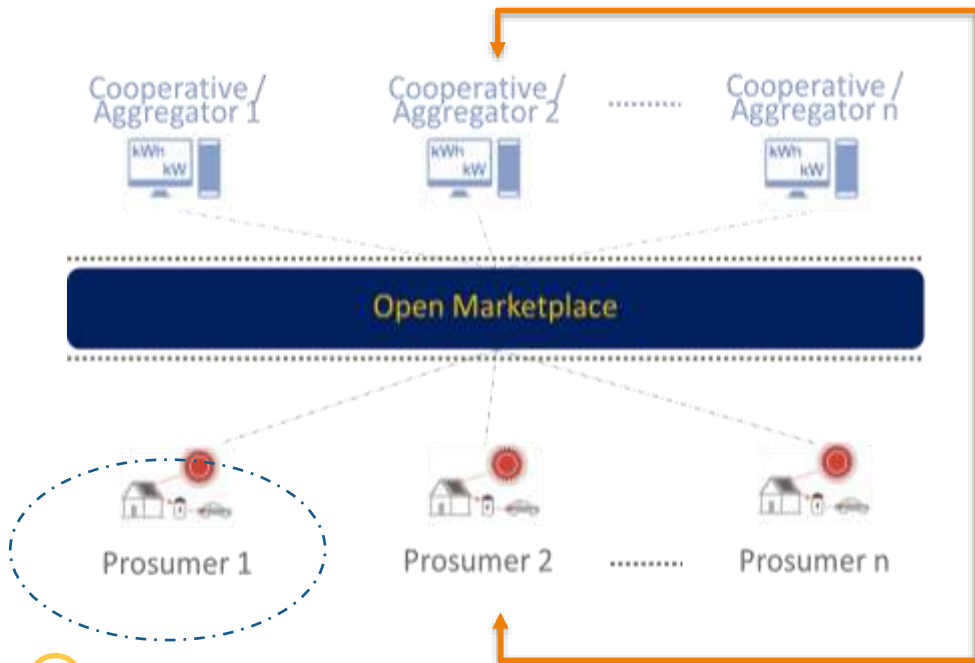
Increased Empowerment

FLEXCoop OSB



- 0 Prosumer obtains an OSB

② **Aggregator** searches for available DERs



③ **Aggregator** selects suitable DERs and publishes contracts to prosumers

④ **Prosumers** are informed on published contracts

⑤ **Contract negotiation**



① **Prosumer** advertises his DERs

① **Prosumer** obtains an OSB

✓ **Contract signed**

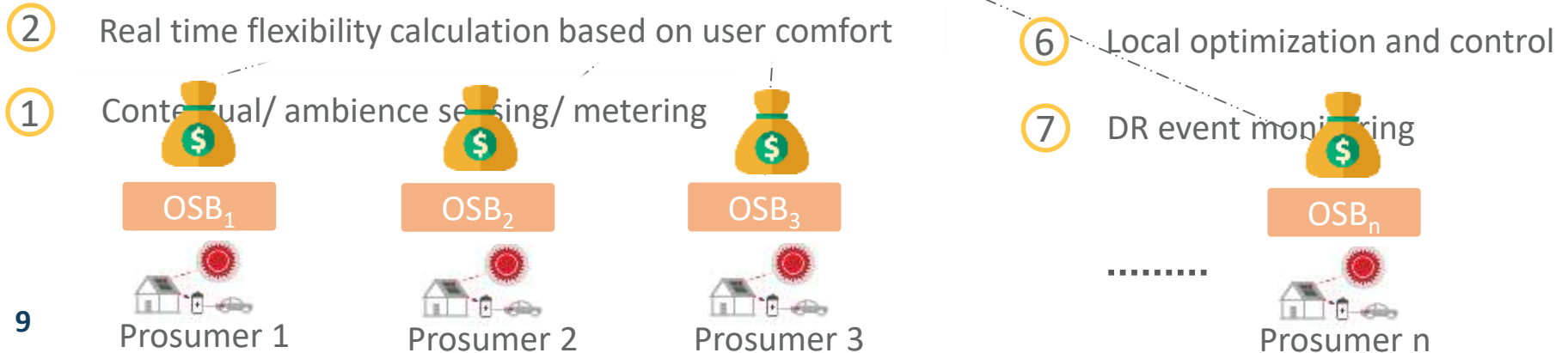
FLEXCoop solution / after signing a contract...



Cooperative / Aggregator



Open DR Optimisation & Tools for aggregators





Customer satisfaction

FLEXCoop



Community-based Organisation



Cooperatives' Willingness

Thank you for your
attention...!!!



FLEXCoop

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FIRST INTERNATIONAL ENERGY COMMUNITIES CONFERENCE
Mechanisms and technologies: Creating energy communities
– 9th of October, 2019 – Lisbon, Portugal

VALALAKI KATERINA



MERLON in a nutshell

MERLON introduces an **Integrated Modular Local Energy Management Framework for the Holistic Operational Optimization of Local Energy Systems** in presence of **high shares of variable distributed RES**.

Strategic Targets

- 🎯 Further increase of RES integration
- 🎯 Increase Security of Supply
- 🎯 Decarbonisation of EU energy future
- 🎯 Cost-efficient solution avoiding grid infrastructure upgrade

Major Stakeholders involved

- 🎯 DSOs
- 🎯 Aggregators
- 🎯 Prosumers/Asset Managers

DER Technologies involved

- 🎯 RES
- 🎯 BESS
- 🎯 Local energy system optimization via:
Demand Response, Electric Vehicles, Synergies among energy vectors

MERLON in a nutshell

MERLON framework includes pilot testing and validation in real-life conditions in an attempt to demonstrate its techno-economic feasibility.

Two assorted “energy islands” incorporating different energy carriers and technologies under different market conditions.



French Pilot Site

- SOREA – DSO supplying 15,000 customers in the Maurienne Valley
- Pilot demonstration in a LV branch
 - commercial and industrial entities
 - 2 PV plants
 - 72 kWp
 - 89 kWp
 - EV charging station

Austrian Pilot Site

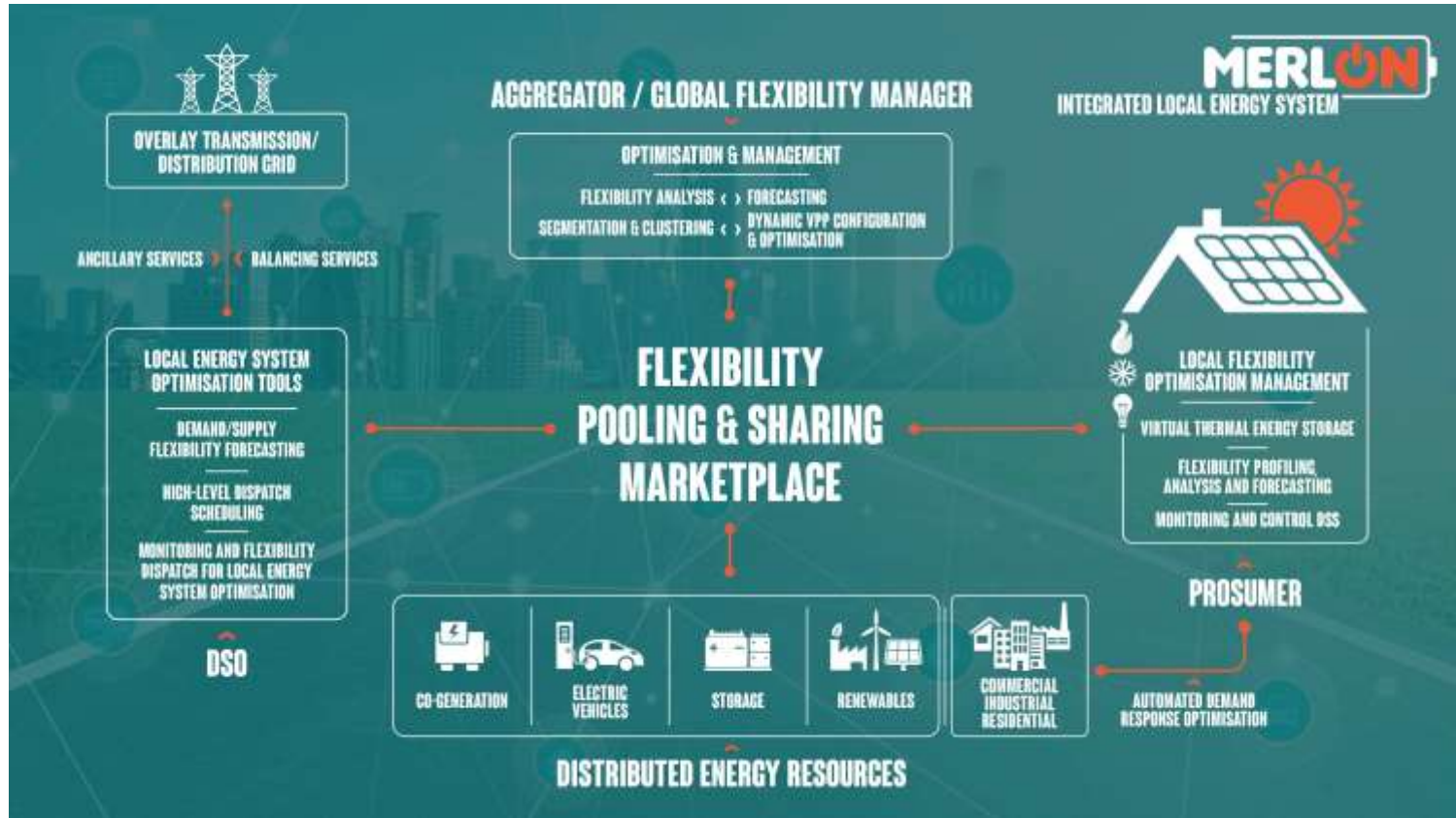
- Energie Güssing – DSO supplying 3,500 customers in Burgenland
- Pilot demonstration in the town of Strem
 - 630 inhabitants
 - 240 residences
 - 18 PV plants (in total ~1.7 MWp)
 - Biogas CHP plant (500 kWel)
 - EV charging station

Challenges

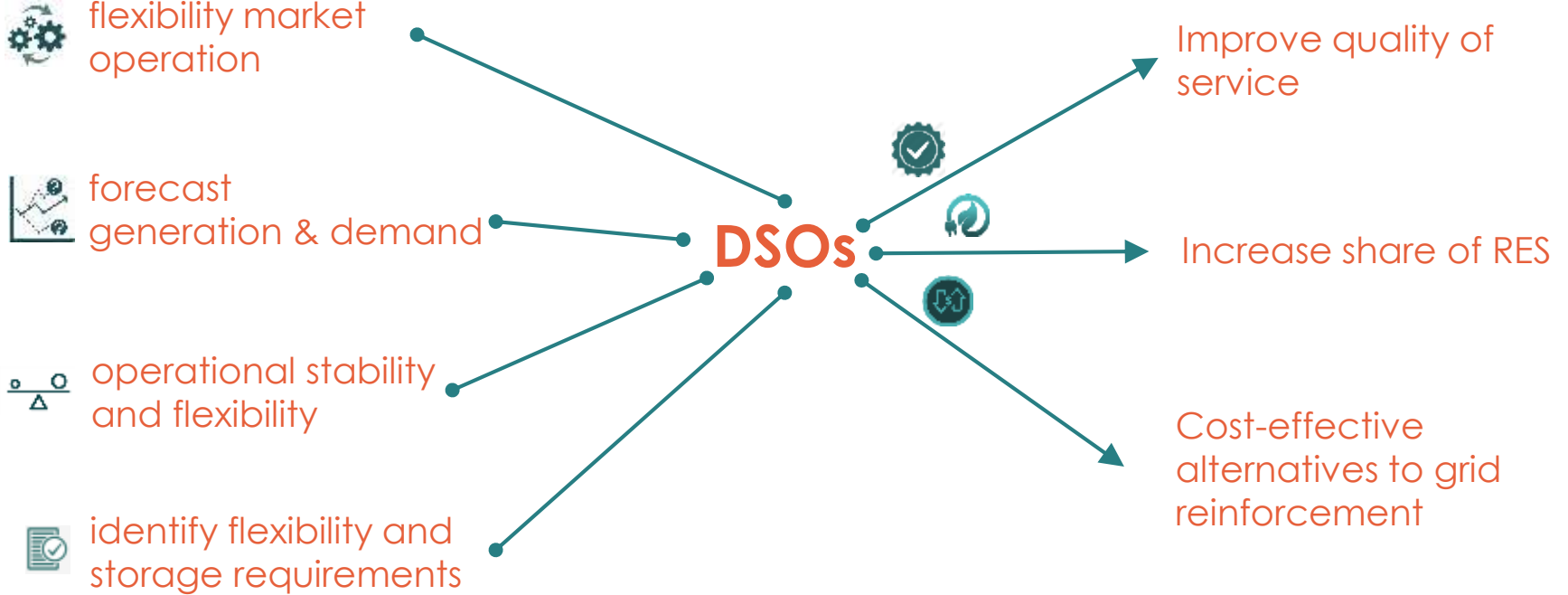
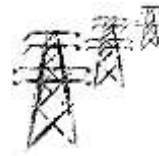
- 🎯 The MERLON framework will address the challenges of **high VRES penetration** and de-carbonization to the electrical grid **without** resorting to **large-scale investments** for grid reinforcement and VRES curtailment.
- 🎯 **Disrupt the centralized, locally monopolistic** market incumbents in the energy sector and allow **local communities** to become **active market** stakeholders, thereby enhancing the **local economy** and community.
- 🎯 **Active participation** of consumer in the flexibility framework through **customer engagement** strategies and context-aware flexibility extraction respecting **user comfort**.



Solutions proposed



Solutions proposed / DSO



Solutions proposed / Aggregator



forecast
generation & demand



DR & demand
flexibility



context-aware flexibility
profiling of prosumers



flexibility trading settlement
and remuneration



flexibility-based VPPs for
cooperative micro-grid
stability

Aggregators



RES integration /
curtailment
avoidance

Resiliency and
security of supply

Solutions proposed / Prosumer



Expected outcomes

Creation of a holistic optimization & DER coordination for **Local Energy Communities** :

- 🎯 **BESS** integration and interconnection at key network locations of Integrated Local Energy Systems (ILES)
- 🎯 **Optimal coordination of local flexibility resources**
- 🎯 Grid balancing via **flexibility-induced self-consumption leading to VRES curtailment elimination**, ultimately in islanding scenarios
- 🎯 Contribution to the establishment of **Local Energy Communities**
- 🎯 Establishment of **locally organized flexibility markets** with transparent market transactions and benefit sharing among all stakeholders
- 🎯 Empowerment of local energy stakeholders and the establishment of **viable business cases upon innovative clustered structure** based on ILES

Thank you !

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CONSORTIUM

MERLON

Development of an integrated modular local energy management framework for the holistic operational optimisation of local energy systems

WWW.MERLON-PROJECT.EU

PILOTS

The image shows a map of Europe with several countries highlighted in red. These countries are marked with icons representing pilot locations: the United Kingdom (labeled '2'), Belgium (labeled '2'), France (labeled '2'), Spain (labeled '2'), Greece (labeled '3'), and Italy (labeled '2'). The word 'PILOTS' is written on the map with lines pointing to these locations.



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