

Smart buildings solutions: can cooperatives make it happen?


2021
**ANNUAL
GENERAL
MEETING**
22 - 24 April - Online



REScoopVPP workshop - 22/04/2021



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 893240



Welcome & practicalities



Smile, you're being recorded!



The agenda was adapted



Use the chat



Agenda



Introduction (45')

Break-out sessions (60'):

- session 1: Open source & collaborative tools
- session 2: Feedback session on presented services: what services for your cooperatives?

Summary & conclusion (15')



Part 1: Introducing the most advanced community-driven smart building ecosystem



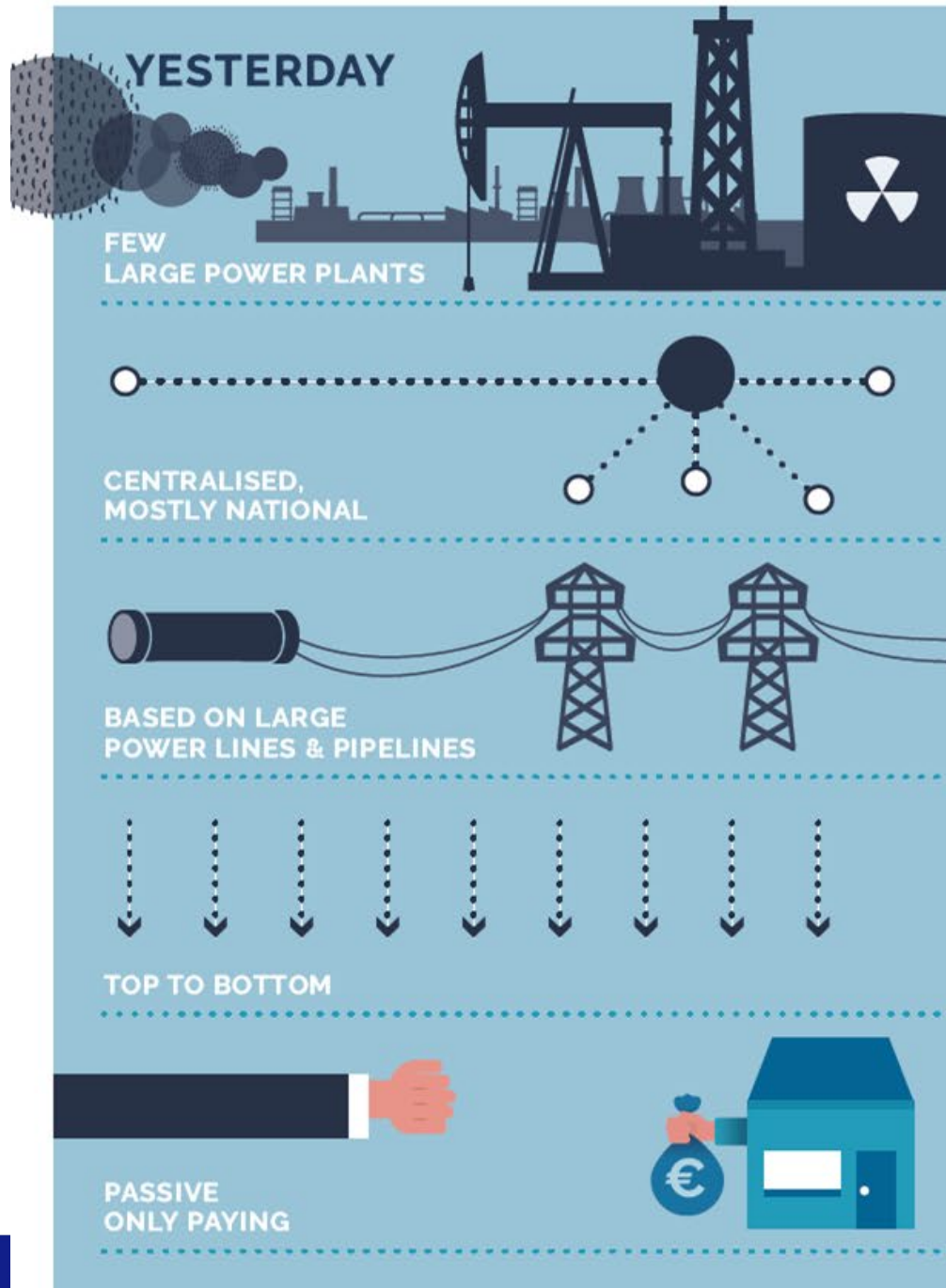
The new landscape of energy services

by Roland, REScoop.eu



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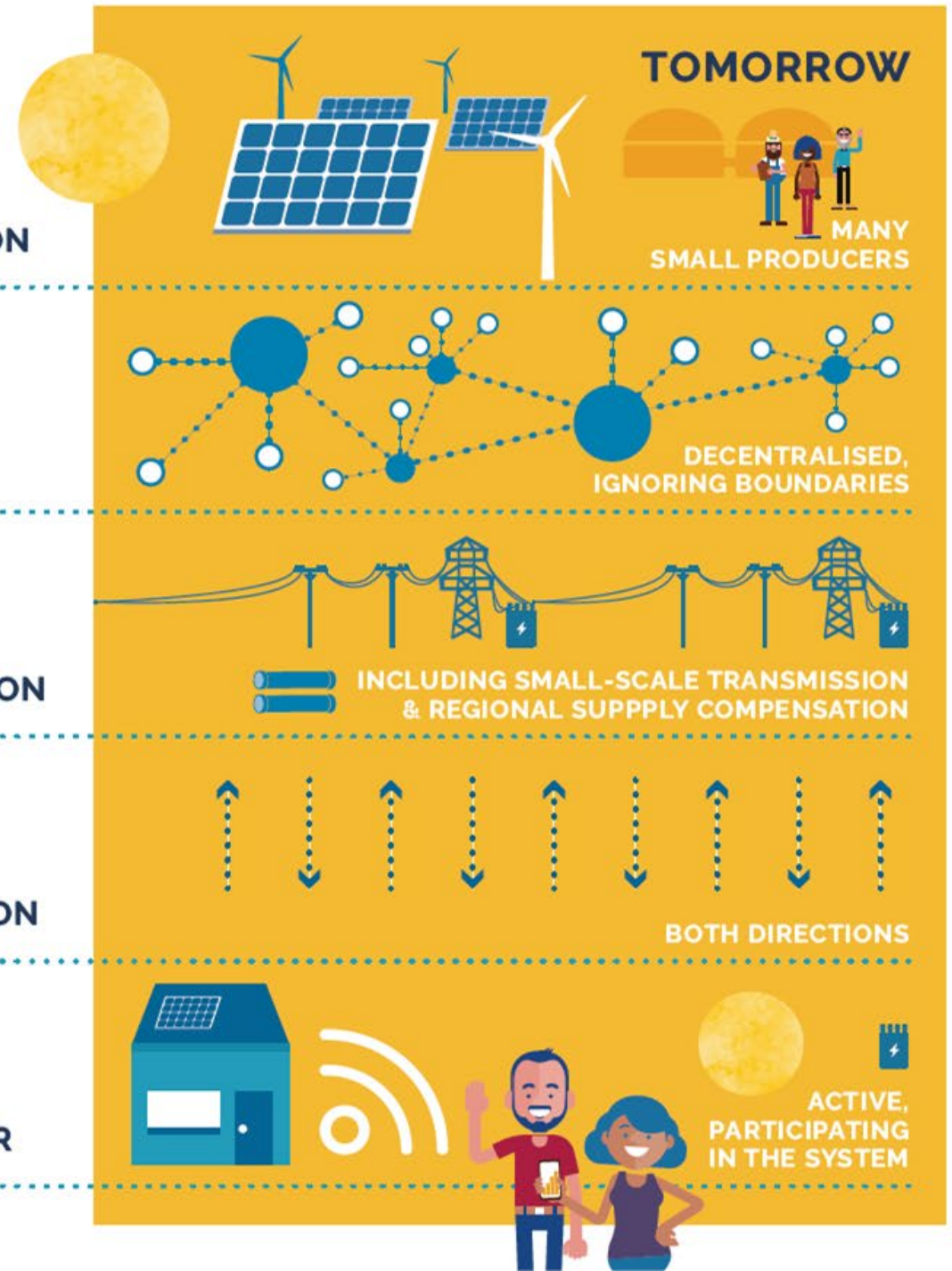
PRODUCTION

MARKET

TRANSMISSION

DISTRIBUTION

CONSUMER



A new role for end-users

1

AVAILABILITY OF
RENEWABLE ENERGY

2

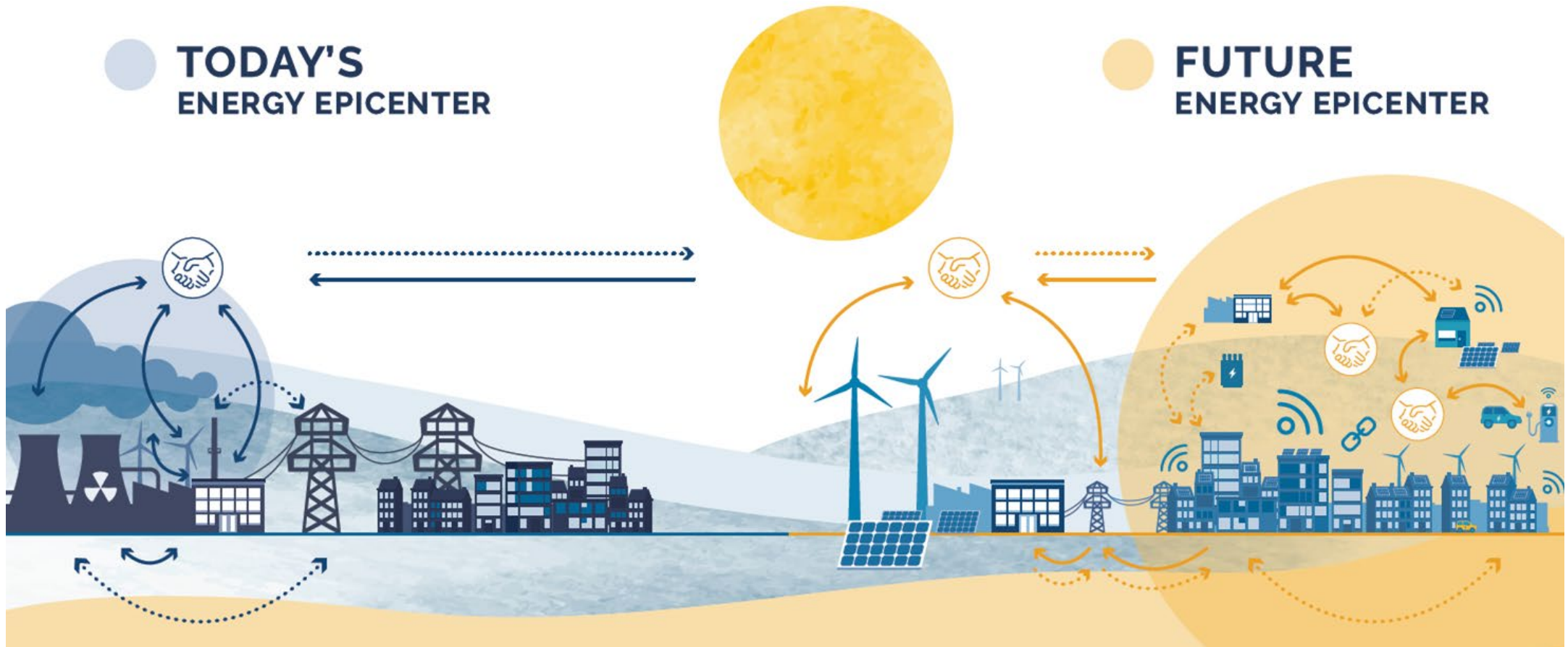
QUALITY
OF ELECTRICITY

50 HZ

3

OPTIMISATION OF
INFRASTRUCTURE

The new landscape of energy services



GENERATION FOLLOWS CONSUMPTION



DEMAND FOLLOWS GENERATION

Credit: original concept by ELIA



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REScoopVPP: the project

by Vincent, EnergielD



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Our ambition

“The REScoopVPP project wants to create the **most advanced community-driven smart building ecosystem for energy communities.**”



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We're an EU project developing energy flexibility tools by co-ops for co-ops!



REScoopVPP

The main aim of REScoopVPP is to set-up a community-driven virtual power plant that can actually provide flexibility services to the grid and contributes to a 100% share of renewable energy sources into the grid.



Start - June 2020



12 project partners

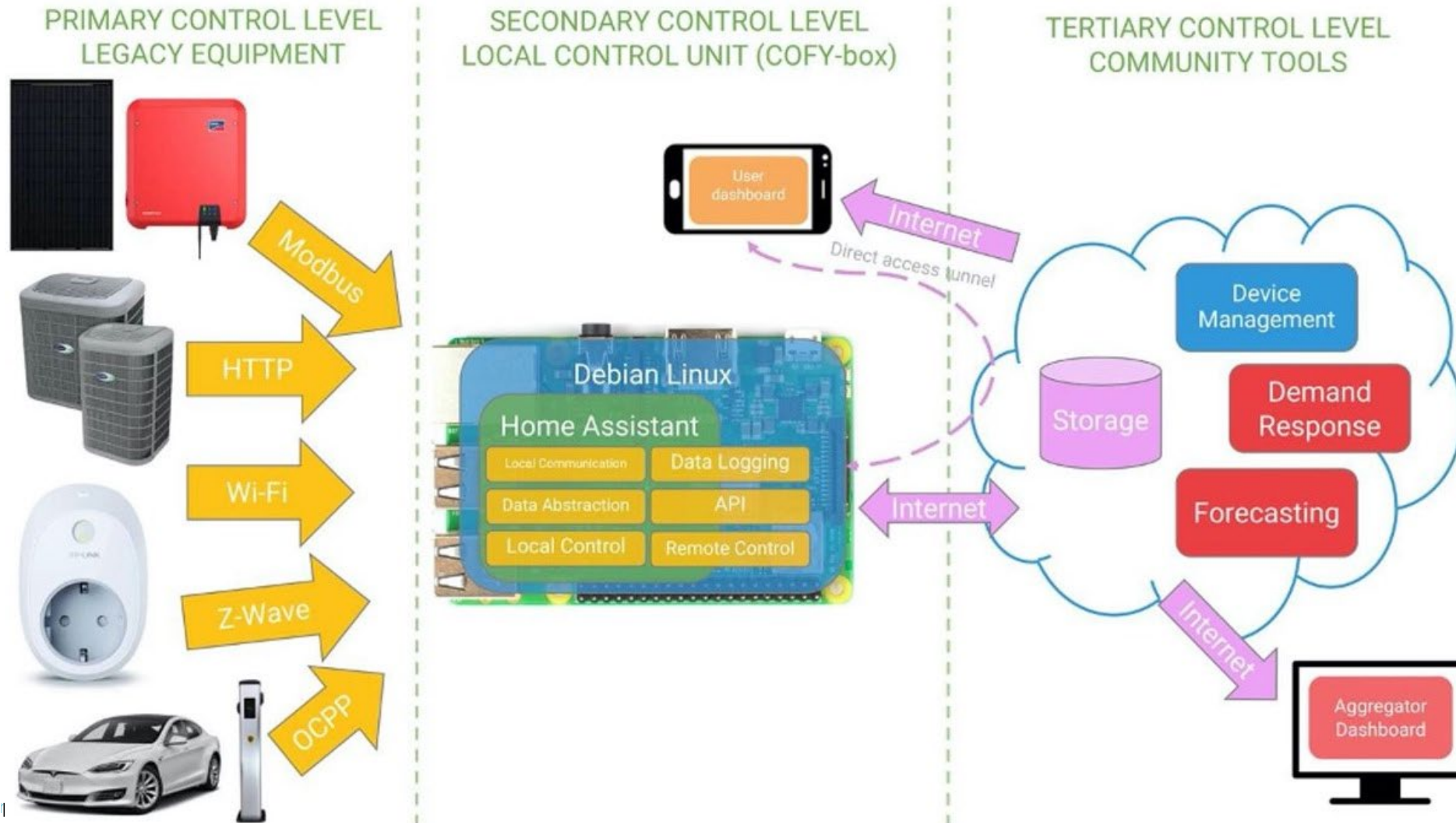


5 pilot sites



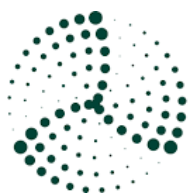
Tools for a community-driven flexibility system

General overview



Large-scale demonstration

Carbon
Co-op



Ecopower
CV

&



Energent

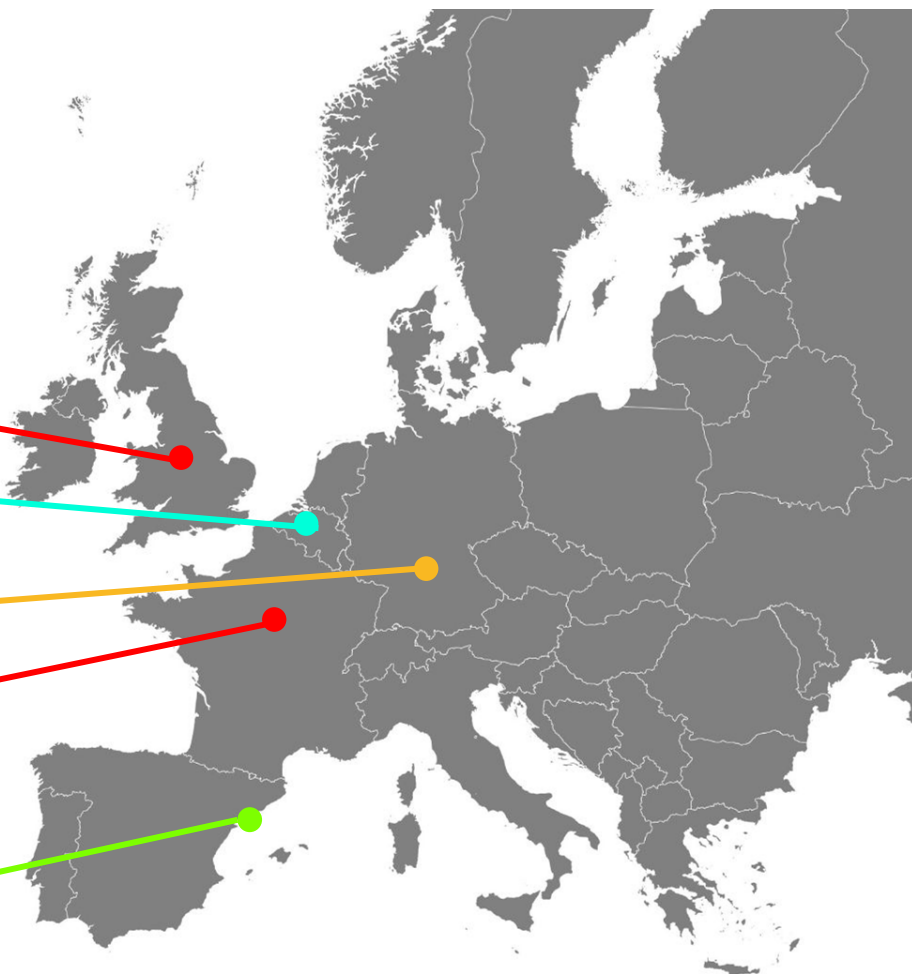


Bürgerwerke
Energie in Gemeinschaft

enercoop
L'énergie
militante



SOM
energia



credit: vermaps.com



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Enabling 5 innovative services, but which ones?

by Malte, Bündnis Bürgerenergie



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Innovative services for cooperatives:

1. An energy monitoring app

Gathering data...



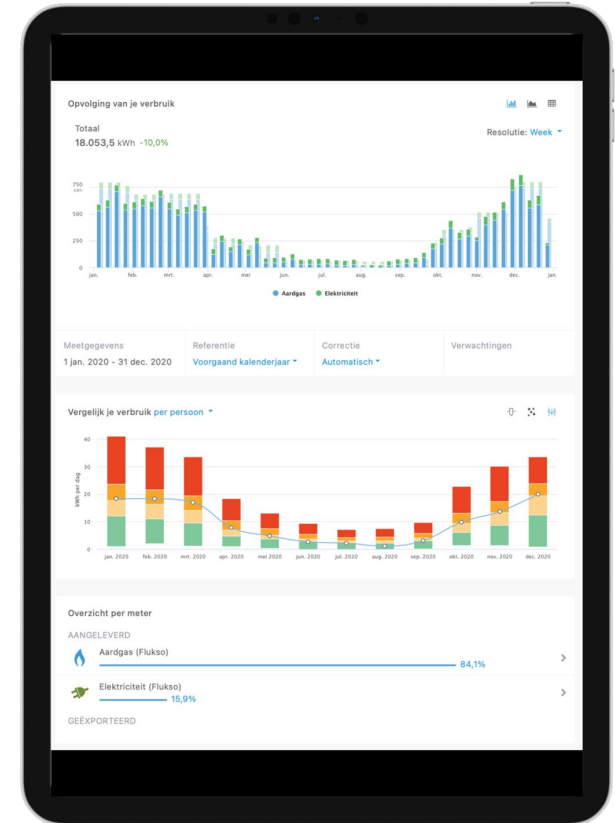
- to know and compare the **what** and **when** of your consumption



- by offering an integrated tool to members



- to gain actionable insights



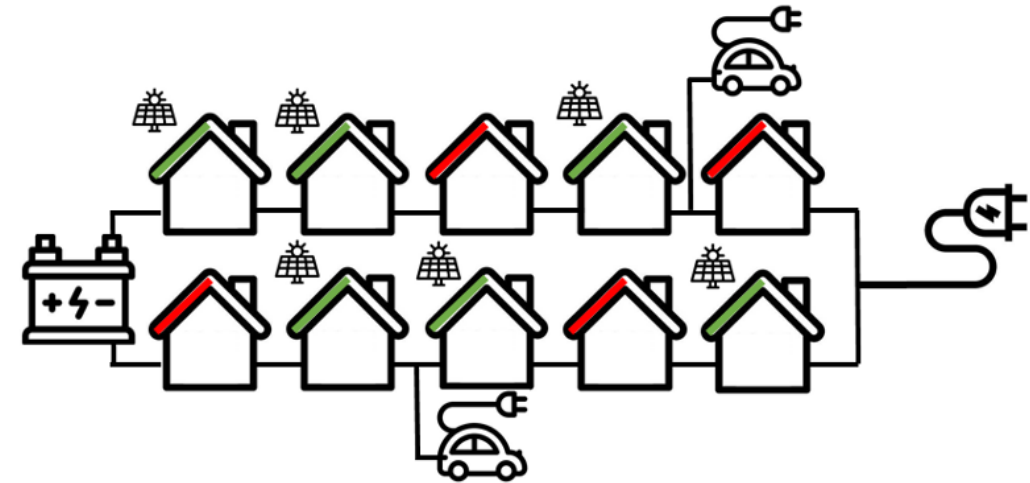
Innovative services for cooperatives:

2. Energy Performance Services

Sharing insights...



- by linking individual data together within a community
- to manage distributed members & assets in an aggregated view
- to receive tailored support from your local coop



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Innovative services for cooperatives:

3. Enabling local flexibility

Shifting loads...



- to increase the direct use of local PV-production and the storage of excess energy



- by offering the COFY-Box



- to decrease grid interaction, and therefore your bill



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Innovative services for cooperatives:

4. Dynamic time-of-use tariffs

Shifting loads...



- to increase the use of renewables & decrease portfolio imbalances



- making use of lower wholesale prices



- making use of lower retail prices



Source: GreenFlux



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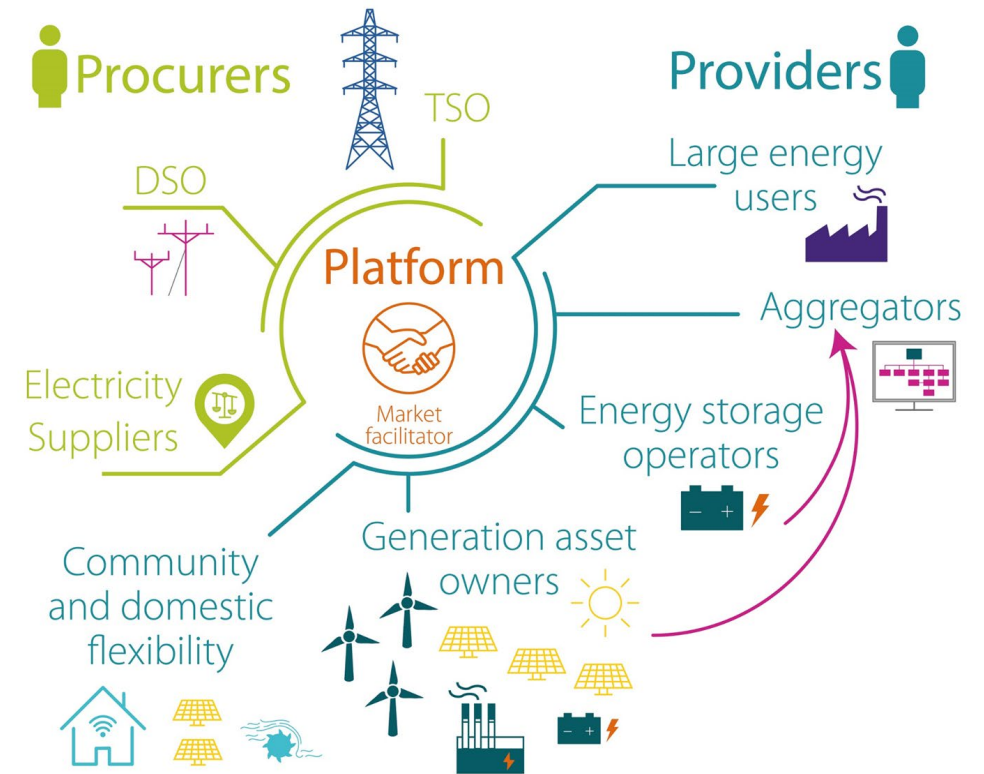
Innovative services for cooperatives:

5. Grid support services

Shifting loads...



- to sell aggregated flexibility to the DSO/TSO for congestion management/ancillary services
- for compensation from DSO/TSO
- for compensation from the coop



Source: regen





Outlook:

Building a European Service Company

Providing innovative technology...



- as a service to REScoops - collaborative, open-source
-  • through shared investment - by coops for coops
-  • for shared benefit of common R&D



Open-source & collaborative tools

by Joannes, Gent Uni.

Peter, Carbon Co-op

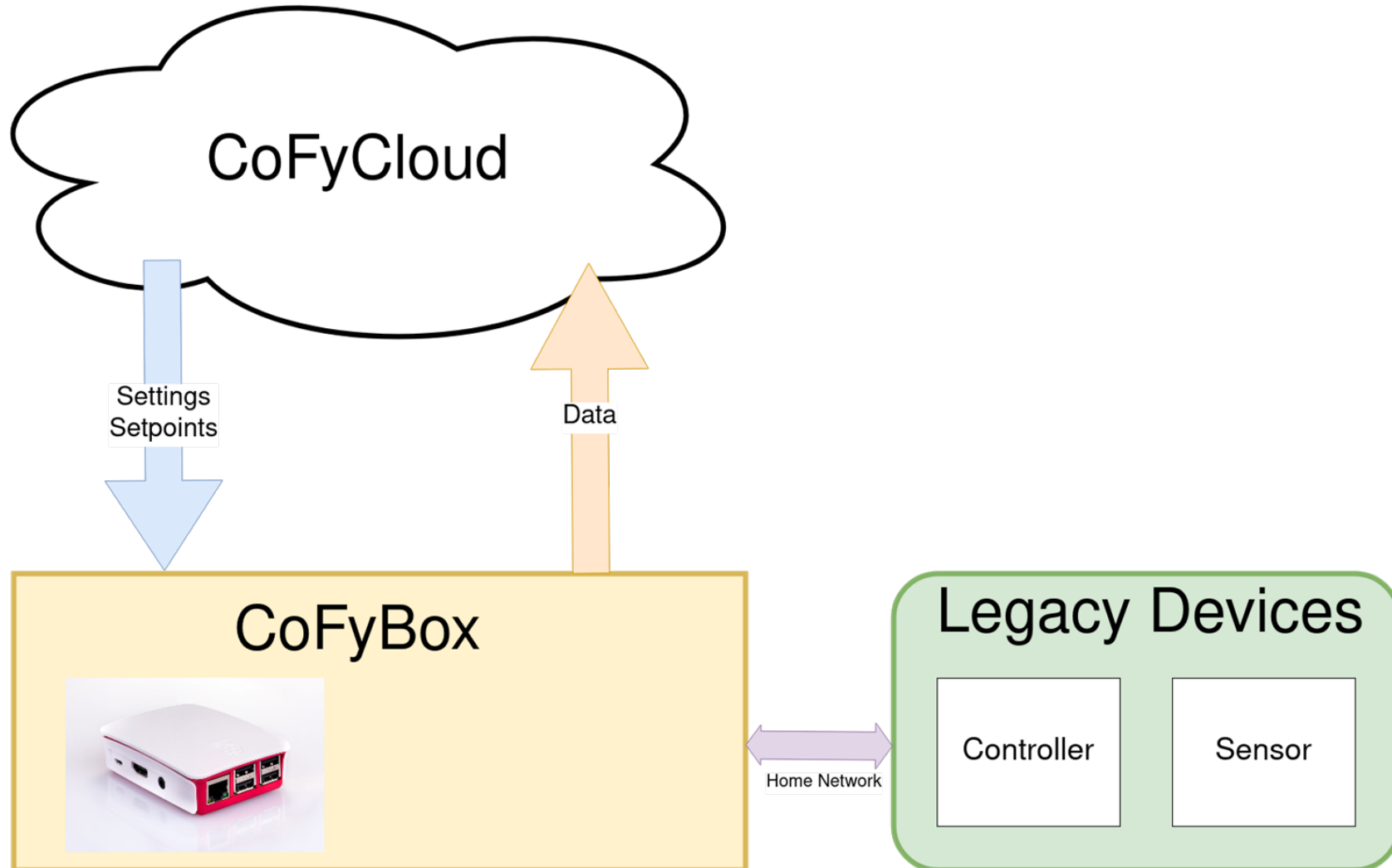
Adrien, Enercoop



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The CoFy Ecosystem



Connecting legacy equipment

Equipment already installed in homes, buildings, ...



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Connecting legacy equipment

Equipment already available on the market

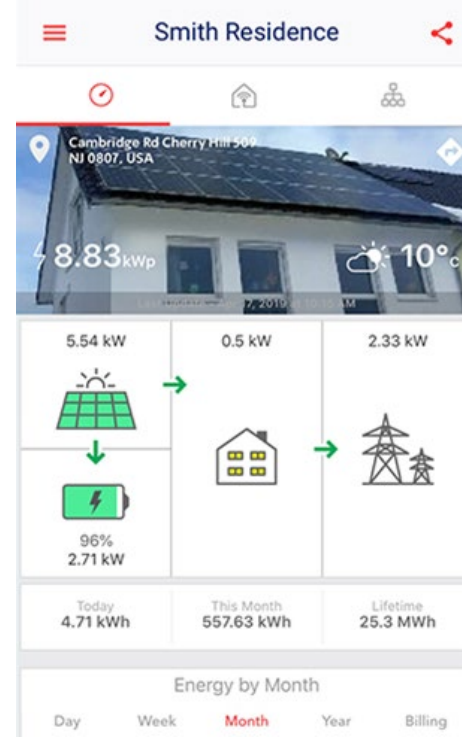


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Open-source & collaborative tools

Challenge: how to measure and control legacy devices?



Open-source & collaborative tools

- Leverage work done by open source community
- Home-Assistant as pathfinder
- Contribute own developments
- in turn

 Advantage Air	 Ambiclimate	 Atag	 AVM FRITZ!SmartHome
 BSB-Lan	 Climate	 CoolMasterNet	 Daikin AC
 Danfoss Air	 devolo Home Control	 Dyson	 ecobee
 Elk-M1 Control	 EPH Controls	 eQ-3 MAX!	 EQ3 Bluetooth Smart Thermostats
 EZcontrol XS1	 Fibaro	 Flexit	 Generic Thermostat



The CoFyBox

- In-home device
 - Connected to home network and legacy devices
 - Connected to the CoFyCloud over the internet
- Runs “blocks” of software - for example
 - Home Assistant - used for automations
 - Metering
 - Explicit and implicit demand response schedule calculator
- Blocks can be developed using Docker and Python code



The Forecasting Tools

Calendar data

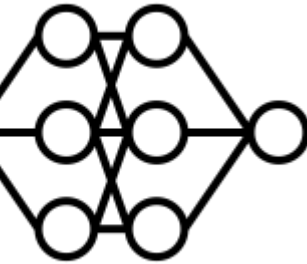
A set of tools to forecast the total load and total production of a supplier's portfolio



Supplier Portfolio

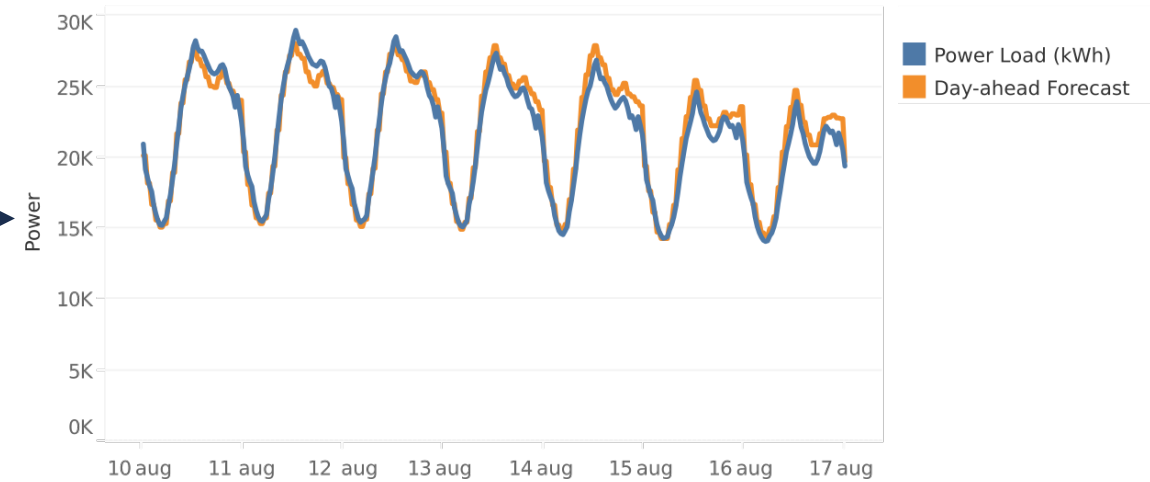


Weather data



Machine
Learning
Algorithms

Load day-ahead forecast vs real data, 30min time step



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More Information

- Breakout Interactive Session 1 - next
- Documentation Site - <https://docs.cofybox.io/>
- Gitlab Group - <https://gitlab.com/rescoopvpp/>
- Enercoop Forecasting Github Repository - <https://github.com/enercoop/enda>



Part 2: Break-out sessions



Break-out sessions

Session 1: **Open source & collaborative tools**

→Join the breakout session by putting your name in the chat!

Session 2: **What services for your cooperative?**

→Stay here in the main room!



60 minutes → everyone back in the main room



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Session 2

What services for your cooperative?

REScoopVPP workshop at REScoop.eu's AGM

22/04/2021



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Agenda

1. Session introduction (REScoop.eu)
1. Informative services for end-users and communities (EnergieID)
2. Increased individual self-consumption (Energent)
3. Collective self-consumption (Som Energia)
4. Collective self-consumption, Mieterstrom (Bürgerwerke)
5. Smart supply, dynamic prices and reduced imbalances (Enercoop)
6. Independent aggregation (Carbon Coop)
1. What are we missing? (Rescoop.eu)



Session format



Presenting service (3')

Feedback (3')



Poll (2')



Cooperative pilots

Carbon
Co-op



Ecopower ^{cv} &

energie **ID** &



Energent



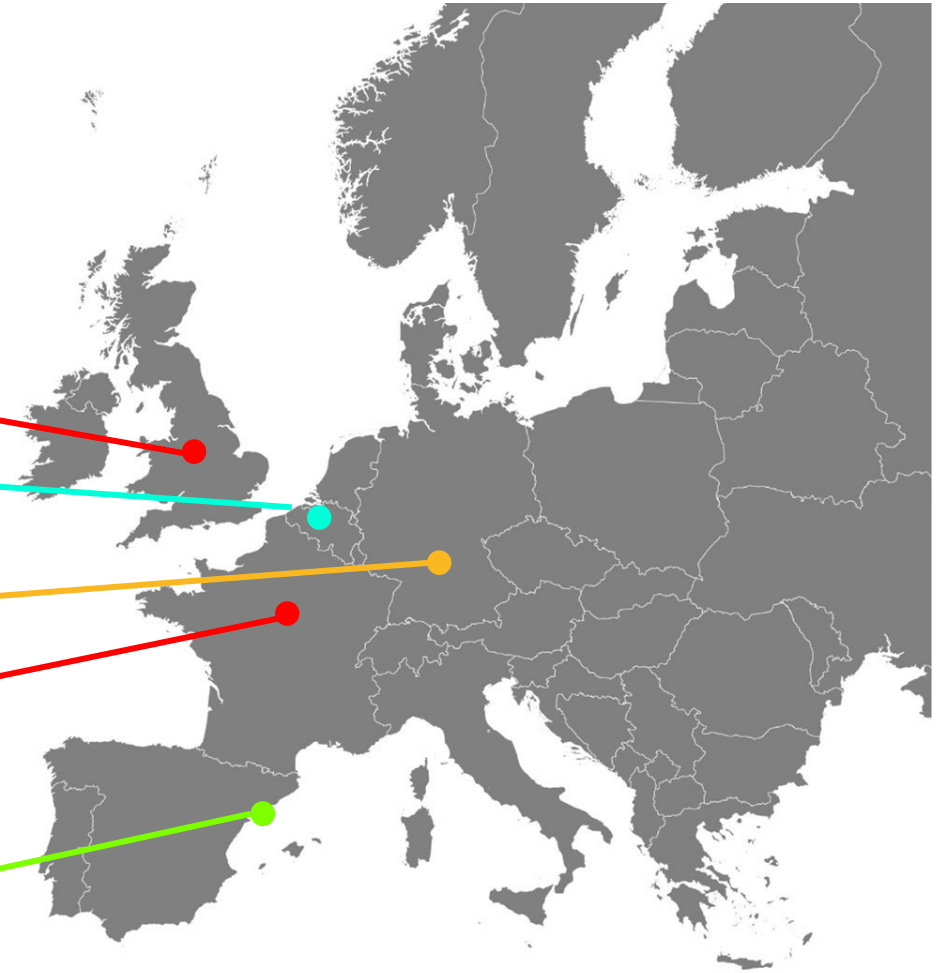
Bürgerwerke
Energie in Gemeinschaft

enercoop

L'énergie
militante



Som
energia



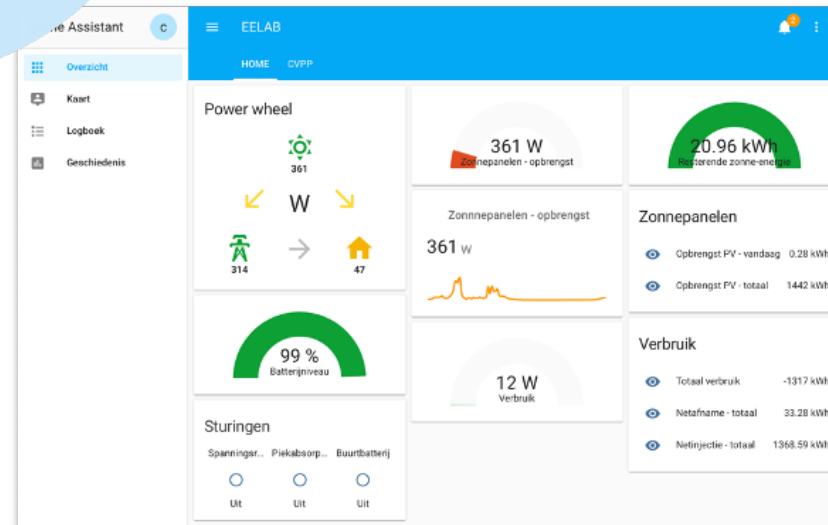
credit: vermaps.com



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Informative services for end-users:

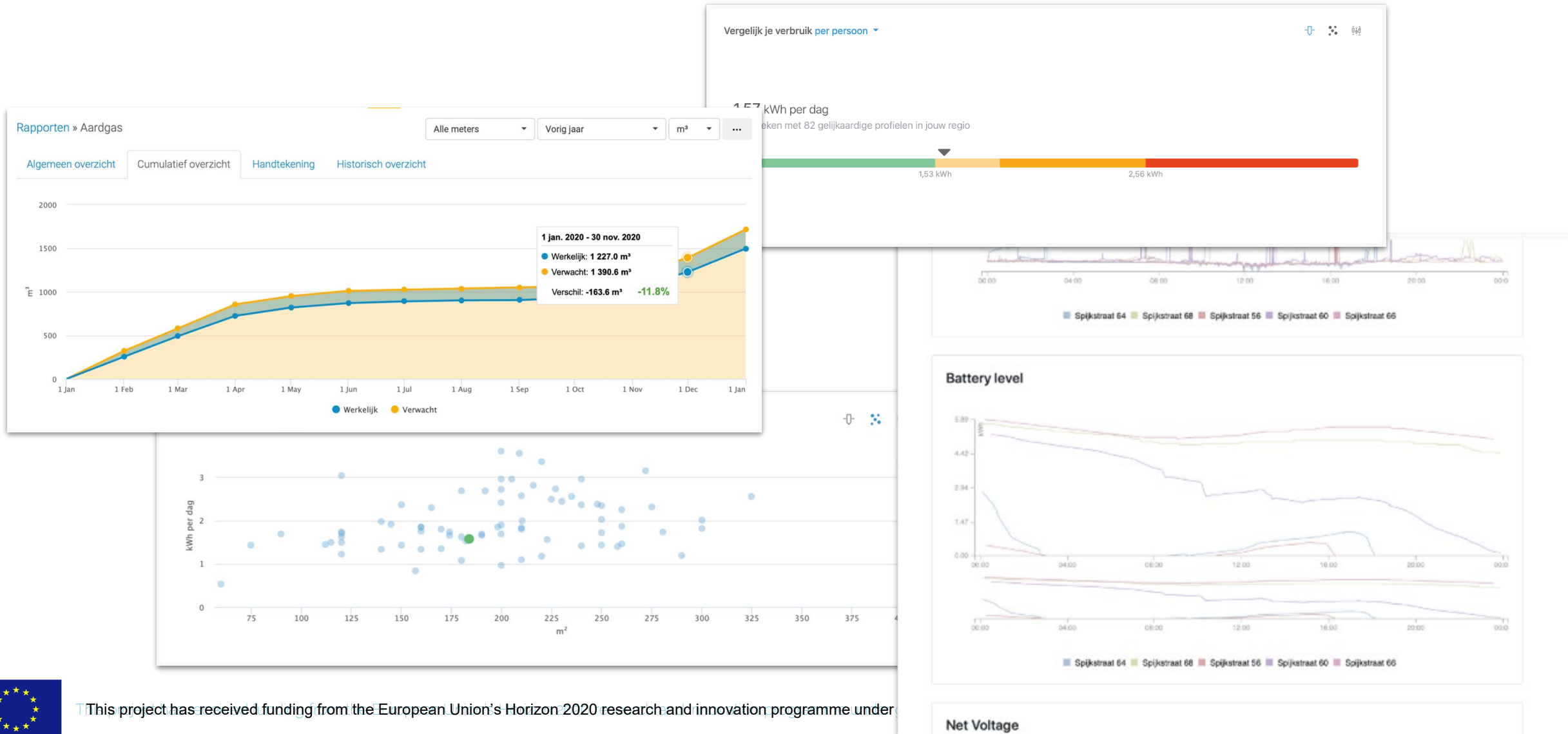


energieID



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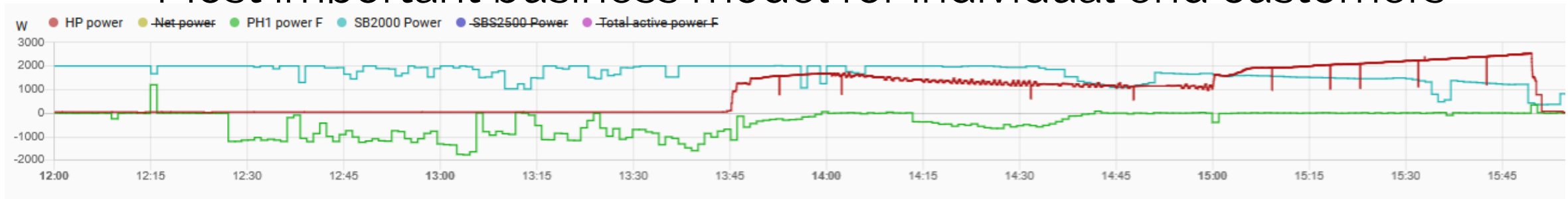
Informative services for communities:



Increased individual self-consumption



- Target group: prosumers with digital meters
- COFY box will optimise individual self-consumption through automated demand side management (Heatpump, EV, immersion boilers, home-batteries)
- Most important business model for individual end customers



Increased individual self-consumption



- COFY box can be provided through a group purchase of residential pv installations or sold by a Rescoop to their members
- Example Flemish context
 - Residential injection tariff: 3-4€/kWh - Electricity tariff: 25-27€/kWh
- In 2022 introduction of Capacity Tariff
 - COFY box aims to reduce impact of capacity tariff on household electricity bill.



Collective self-consumption by Som Energia



PV purchase facilitator → Prosumers Community

We also want to support Energy Communities → we need tools!

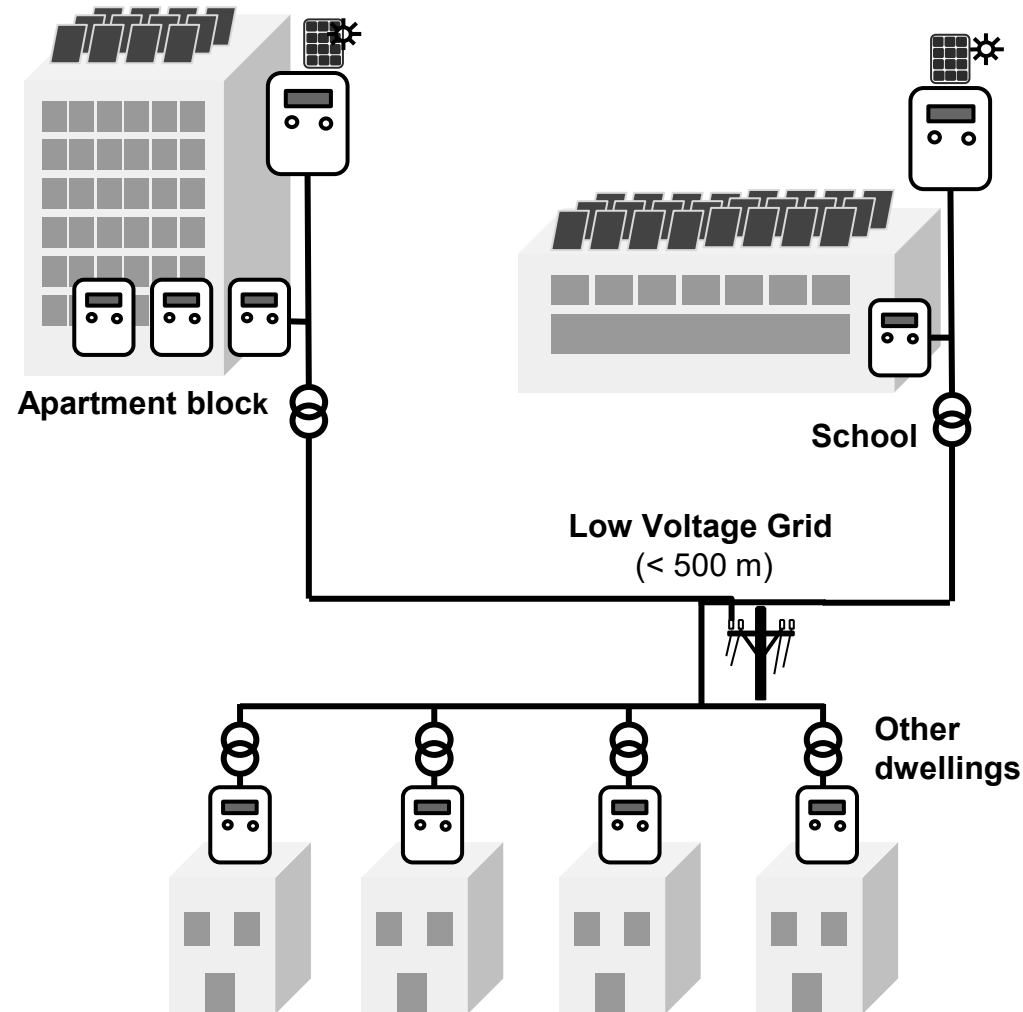
New regulation allows collective self-consumption (RD 244/2019)



REC will kick start under this frame



Collective self-consumption by Som Energia



1. Monitoring tools → increase awareness
1. Optimizing the individual generation share
 - Heat pump, immersion boilers, EV, battery
1. Optimizing the sharing coefficient (β)
 - Currently fixed coeff., but moving to dynamic!



Collective self-consumption (*Mieterstrom*) by Bürgerwerke



BÜRGERWERKE
ENERGIE IN GEMEINSCHAFT

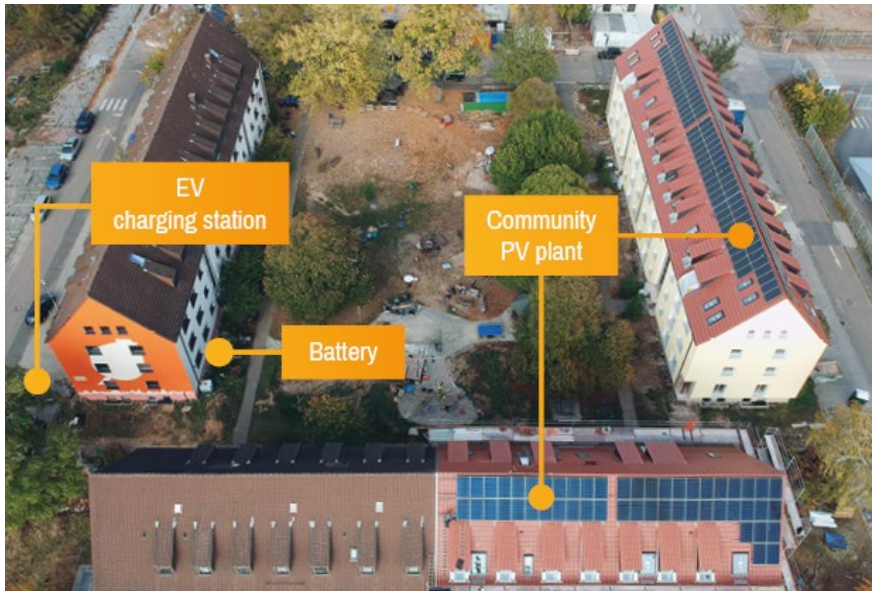
- Bürgerwerke is an association of more than 90 local energy cooperatives and energy communities throughout Germany.
- Our members operate more than 450 PV projects, mostly on existing large buildings (roof rental model, often associated with roof renovation).
- Within the REScoopVPP project, Bürgerwerke will upgrade the smartness in 5 existing commercial, municipal and/or large residential buildings.



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Collective self-consumption (*Mieterstrom*) by Bürgerwerke



- The *Mieterstrom* model was developed in Germany in 2017 in order to allow tenants to benefit from locally produced PV energy
- In our *Mieterstrom* pilot sites, we aim to:
 - **increase collective self-consumption** by shifting automatically the large flexibility assets (Heat Pump, Battery, EV charging station)
 - **enhance awareness of individual end users** by providing visualization of energy data and thus encouraging change of consumption behavior as well as helping them become part of the energy community.



Smart supply: dynamic tariffs and reduced imbalances by Enercoop



Ecopower
cv



- Smart supply services for suppliers
- Enercoop is a cooperative supplier with 100 000 consumers all over France
- Supply from 350 renewable energy producers



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Smart supply: dynamic tariffs and reduced imbalances by Enercoop

Dynamic tariffs

- Objective: to shift demand to decrease supply costs
- How: by sending implicit DR signal to consumers based either on dynamic tariffs or on forecasted RES production
- Main focus of pilots:
 - for Enercoop test shifting demand to production from our RES producers
 - for Som Energia shifting demand according to market prices & grid fees

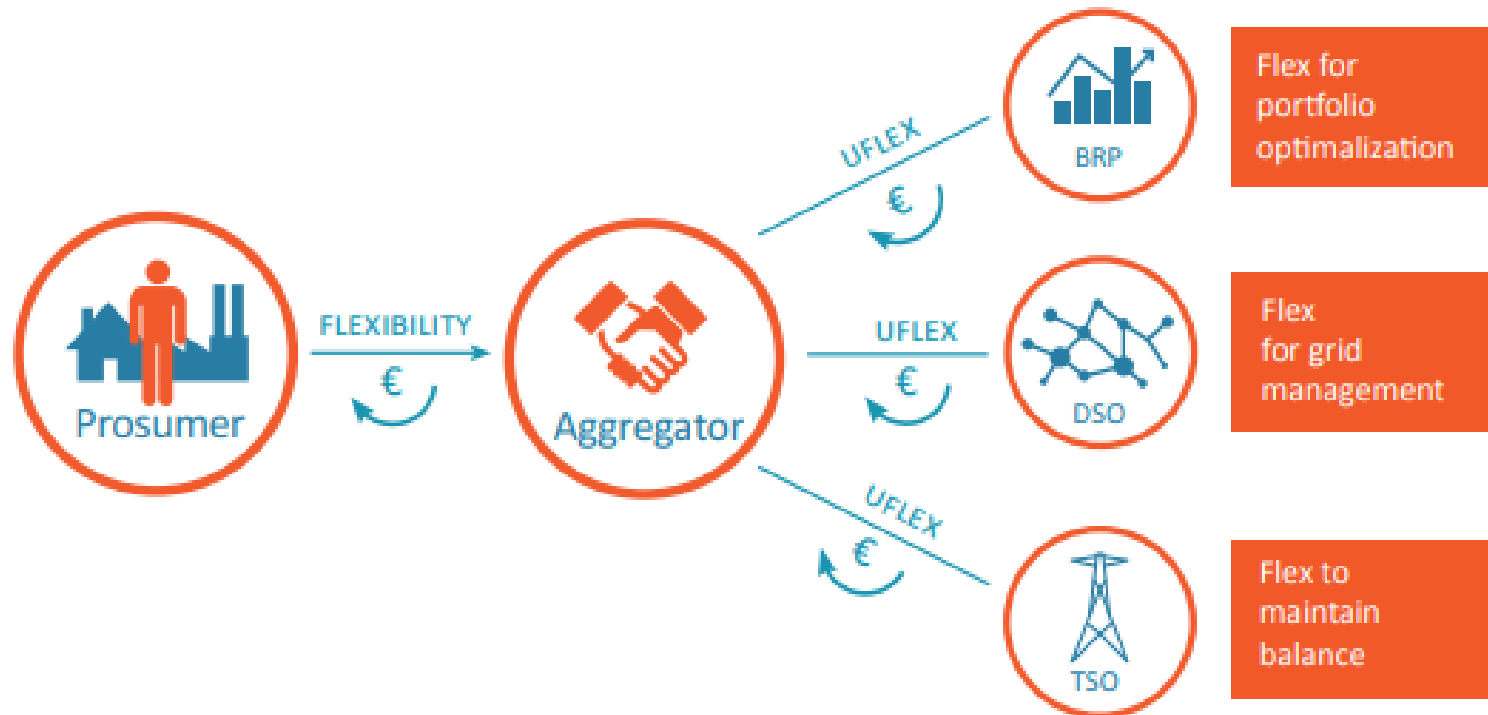
Reduced imbalances

- Objective: to optimize portfolio management by decreasing imbalance costs
- How: by having a more accurate load and production forecast of a portfolio
- Main focus of pilots: test forecasting tools by suppliers in the project



Independent aggregation by Carbon Co-op

- Aggregators who are not necessarily BRP or retailer.



Credit: USEF

Independent aggregation

- Difficult in many European markets currently but DSO and TSO/ESO schemes exist.
- In future, hopefully either coordinated regional flex markets or a single national scale market.
- In some markets this will represent opportunity for co-operative / community energy...



Independent aggregation

- Carbon Co-op is working towards becoming an aggregator/ESCo (energy services company).
- Opportunities in UK - DSO flex schemes, balancing market reforms, ancillary service reforms.
- Synthesis between independent aggregation and our work on improving home energy efficiency which usually involves installing generation/storage/flexible loads (EV chargers, heat pumps).

**Carbon
Co-op**



What are we missing in REScoopVPP?

1. Informative service (dashboard/app) for individual energy monitoring 

1. Informative service Community insights 

2. Increased indiv. self-consumption



3, 4. increased collective self-consumption: energy sharing or Mieterstrom



5. Dynamic tariffs and improved imbalances



6. Aggregation for grid support services



What are we missing in REScoopVPP?

Based on REScoopVPP tools and functionalities, what **complementary services** or **important trends** are we missing and that your coop might be interested in?



1. Informative service (dashboard/app) for individual energy monitoring 

1. Informative service Community insights 

2. Increased indiv. self-consumption



3, 4. increased collective self-consumption: energy sharing or Mieterstrom



5. Dynamic tariffs and improved imbalances



6. Aggregation for grid support services



Part 3: Summary & Conclusions



Summary from break-out sessions



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Conclusion and next steps



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Join the **FLEXIBILITY** Working Group



More information:
roland.tual@rescoop.eu



Keep in touch



rescoopvpp.eu

@REScoopVPP



REScoopVPP newsletter ...coming up soon!



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Get more people onboard!

An overview of possible flexibility-based services using residential equipment control

- **Clarification on new actors (aggregators, ESCO, ...)**
- **Introduction to flexibility services**
- **Som Energia and Energie Samen experiences**
- **Interview with existing EU aggregators**

www.rescoop.eu/toolbox



Unlocking community-based flexibility to transform the energy system III

Involving citizens in local energy markets

April 30th, 10:00 – 11:30 CET



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