EXPERIENCE WITH SOCIAL-CVPP GENT - ENERGENT
Origin:
- Some people in the neighbourhood wanted to investigate the possibility to share solar electricity.
- They also wanted to keep this solar energy in the neighbourhood and were dreaming of a neighbourhood battery.

The project BUURZAME STROOM was initiated
- together with the city of Gent, DSO, samenlevingsopbouw, University and other partners.
- GOAL: increase solar production, reach all kinds of target groups and investigate solutions for the electricity grid of the future (smart grid, energy storage/balancing).
BUURZAME STROOM – KICK OFF
PROJECT ZONE - CARACTERISTICS

- Urban setting
- Densily populated
- Mixture of population: socio-vulnerable residents, residents with migration background, young well-educated families.
- Renovated houses, old houses, house-owners and tenants.
- SME's, public buildings and schools.
DETERMING THE COMMUNITY VALUES

- Online Enquiry with focus group discussions
- Key Values
  - Stimulating RES in the neighbourhood and making it CO2 neutral
  - Creation of a community to battle climate change more effectively than individually - Decrease impact of big energy companies on energy market
  - Minimise cost for society (avoid grid cost- organise flexibility)
EXPANSION OF RENEWABLE ENERGY SOURCES: SOLAR PRODUCTION DOUBLED THROUGH THE PROJECT
ORGANISATION OF STORAGE

- 2 clusters of residential storage: 16 home batteries
- 1 battery at SME
- 2 pilots with thermal storage through hybrid Heat Pump
- Future extension with extra Heat pumps, EV’s
RESIDENTIAL FLEXIBILITY THROUGH ENERGY MANAGEMENT SYSTEM (EMS)

- Open source architecture: Home Assistant
- Low cost hardware: raspberry Pi
- Maximum flexibility to modify/expand EMS following future developments preventing lock-ins for Energent and participants.

Figur 1: principeschema van de aanbieding
FLEXIBILITY OF HYBRID HEAT PUMP WITH THERMAL STORAGE

Noon

- A lot of Sun: high production
- Heating of thermal buffer
PROBLEM: OVERLOAD OF THE GRID

Noon
• A lot of Sun: high production
• Low consumption
• Batteries fully charged, Solar production loads the grid.
• Voltage on feeder increases
• Inverters are switched off, as tension on feeder rises to high.
SOLUTION: TEST 1
PEAKABSORPTION

- Based on day ahead weather predictions, charging of batteries will be delayed to absorb noon peak optimally
- Evaluate impact on the grid.
SOLUTION: TEST 1
PEAKABSORPTION
PROBLEM: A LOT OF SUN AND ALL BATTERIES ARE FULLY CHARGED

Noon
• Surplus of solar energy
• Tension on the feeder increases (the larger the distance till the MV transformator the higher the tension increases).
• Inverters are switched off, as tension on feeder rises to high.
• As tension on feeder is increasing, EMS will send setpoints to all the inverters on this feeder to reduce production on all inverters.
• No inverters will get switched off.
• Solar production at individual level is lower, but sum of solar production on feeder is higher.
TEST 3
NEIGHBOURHOOD BATTERY

- All solar inverters connected to EMS
- All batteries work together as a virtual neighbourhood battery to keep energy production in the neighbourhood.
- Exchange of energy through the MV network will be reduced.
- Virtual neighbourhood battery could be used as ancillary service towards aggregators.
Organise more demand side management
Expand amount and type of controllable loads
Introduce hybrid heat pumps as an intermediate step towards full electrification

Digital meters will be introduced in Flanders from 2020. Connection of P1 port of digital meters to the EMS is under development.

Introduction of variable electricity prices and implications on business model of storage solutions.

Flemish regulation on ‘regelluwe zones’ & Citizens Energy Communities, which might make ‘zonnedelen’ feasible. (involvement in Rolecs project)
Thank you!