

BUSINESS MODEL INNOVATION

Sustainability cooperation DuCoop




Energy
4de gen. Heat network (waste heat Christeyns)
rooftop PV
Smart Grid appliances



Water
Local sanitation
Reuse as process water (Christeyns)



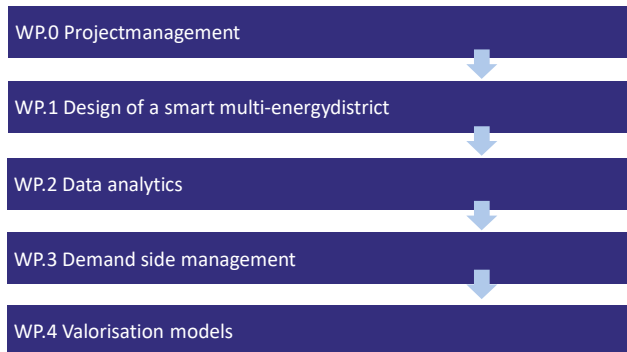
Waste
Source separation e.g. vacuum systems
Waste collection
Water treatment
Nutrient recovery



Mobility
Electric bikes
Electric sharing cars & charging stations



Smart Multi-energy District



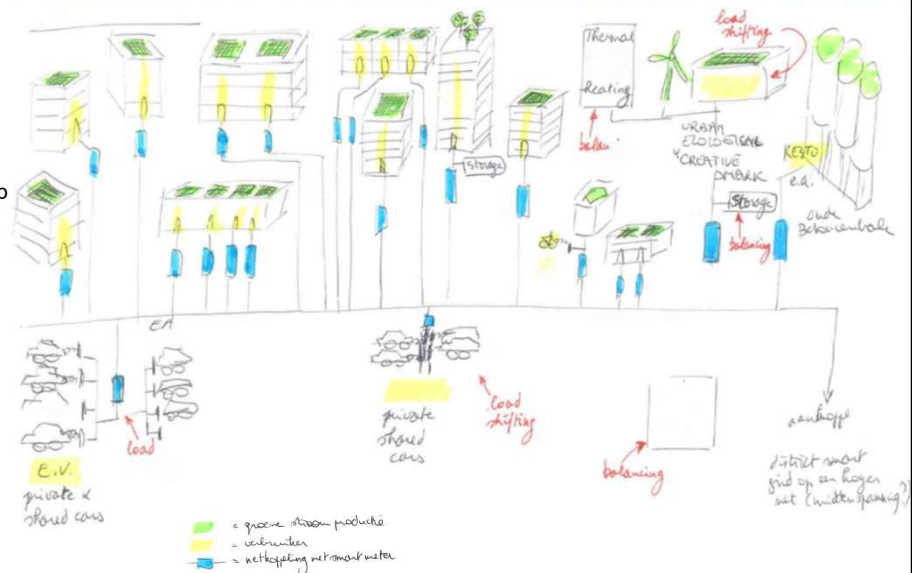
Smart Multi-energy District: Objectives

HEAT

- Match peak consumption with production of wasteheat
- Optimal deployment of heat pump (valorization of RES)

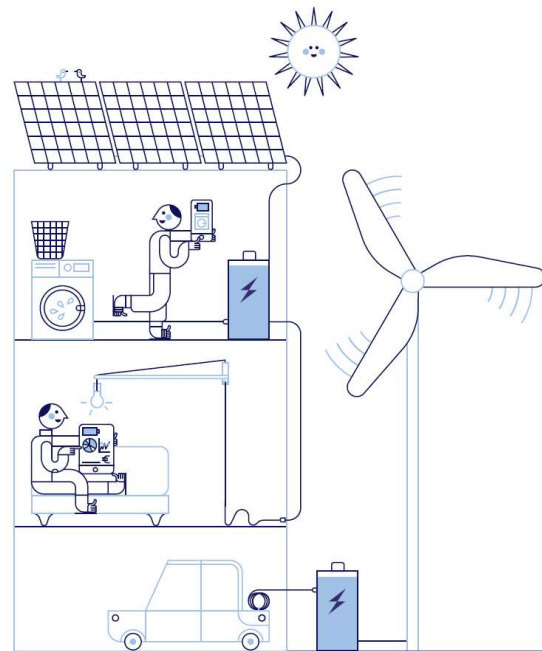
ELECTRICITY

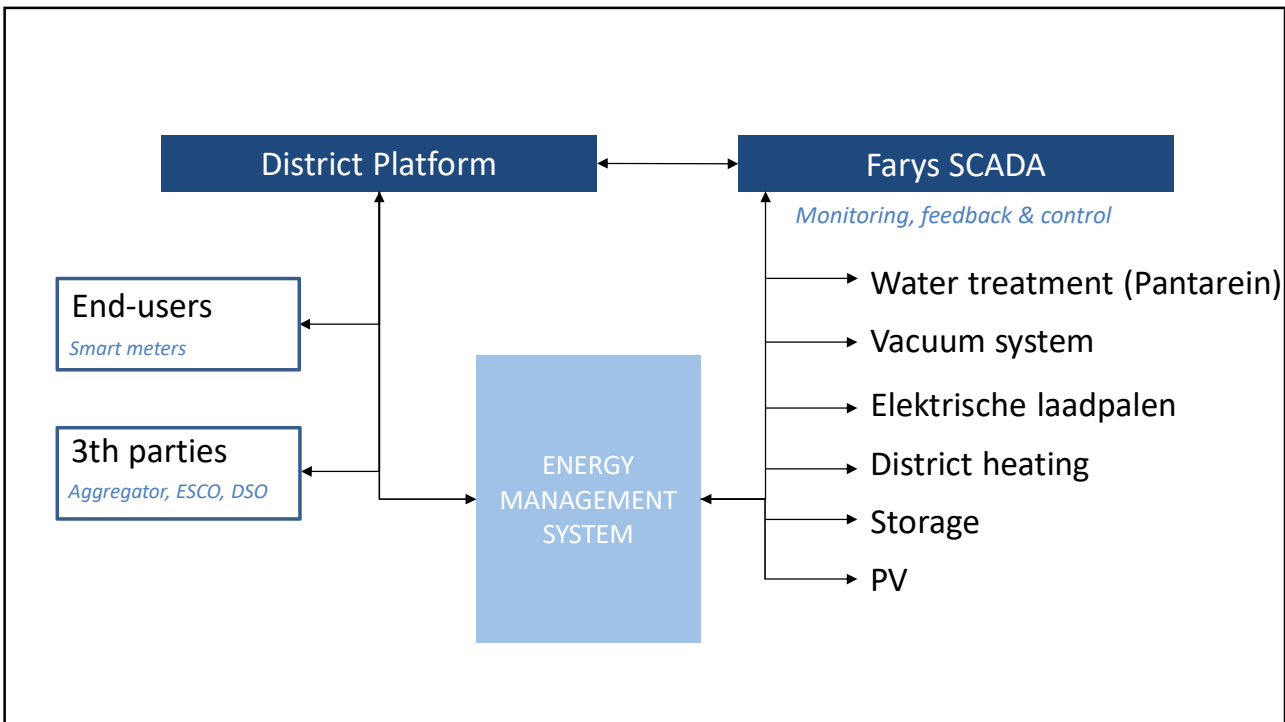
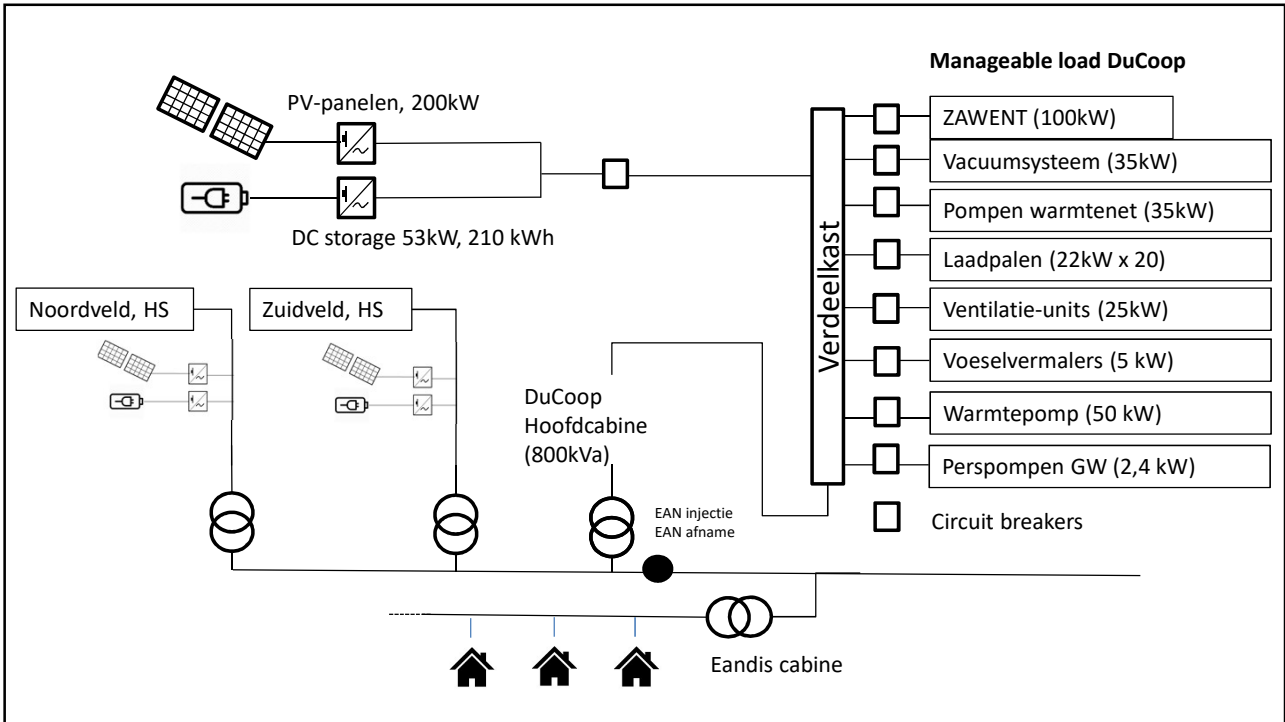
- Balancing of DuCoop portfolio (storage, demand side management)
- Limiting congestion of local DSO-grid
- Grid services (flexibility)



Smart Multi-energy District

- Energy production
 - Solar PV
 - Biogas conversion
- Energy storage
 - Batteries
- Energy smart grid solutions
 - Match demand and consumption
 - Heat and electricity
- Mobility
 - Electric charging stations





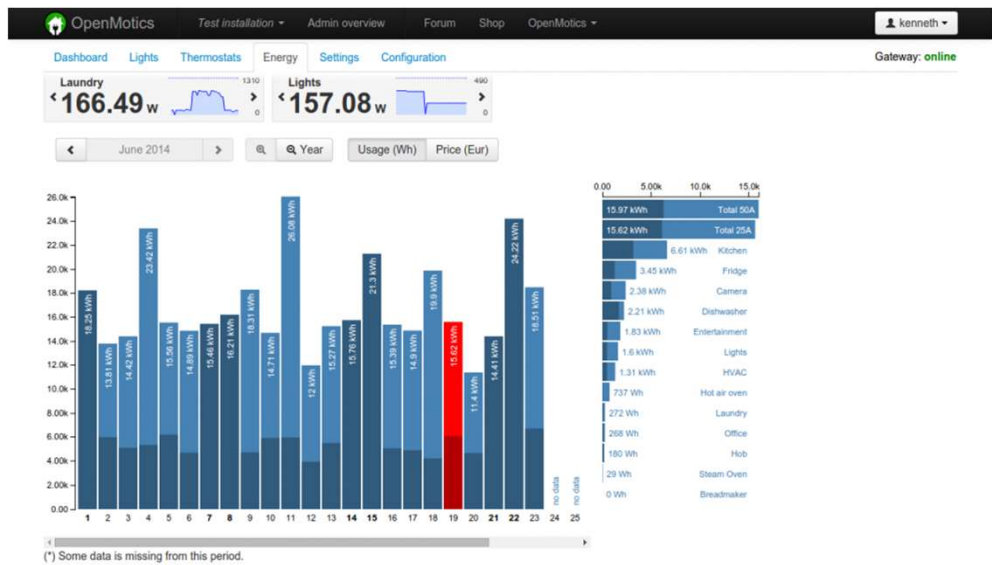
Ambitions as Living Lab

Data collection

- **Real-time collection of end-user consumption and profile** (water, electricity, heat, mobility, peak-demand for each, time-based consumption profile, energy awareness profile)
- **Real-time collection of production, storage (fix/mobile) and consumption data energy services**
- **Link data collection to accounting/ smart building and district management system**
- **Anonymise data for benchmarking, feedback loops and gamification towards consumers and public instances** (city dashboard, environmental services, universities)
- **Forecasting of production and consumption, based on weather forecast and consumption history**
- **Forecasting purchasing cost energy** (day ahead electricity market, in relation to future cost breakdown models based on capacity rather than volume)

Ambitions as Living Lab

Data collection



Ambitions as Living Lab

Data processing

- **Building/district management system displaying life peak consumption and historical data of all components of the smart grid**
- **Algorithms to optimize alignment of production, consumption and forecasts.** Examples can be:
 - Delay consumption in forecast of increasing PV-production
 - Boost temperature district heating grid anticipating peak demand
 - Calculation of highest financial return of assigning PV-production (internal consumption – HP – storage for later use – EV charging point ?)
 - Modelling characteristics of heat pumps to optimize the COP



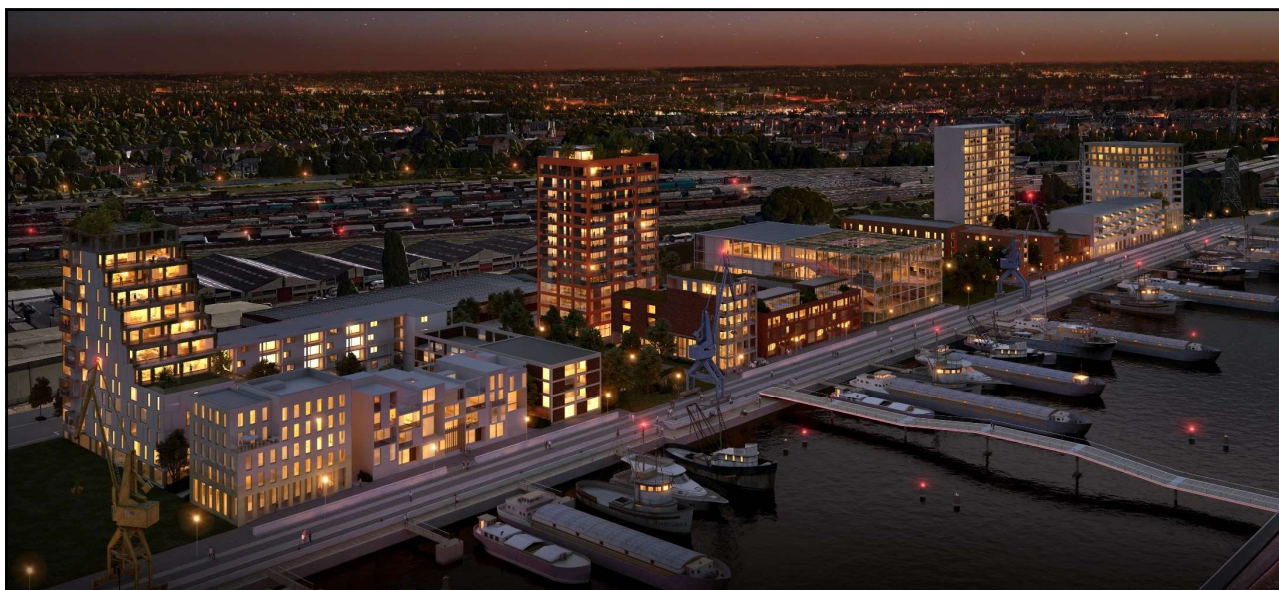
Ambitions as Living Lab

Virtual private grid applications

- **Peak shaving through demand respons** (postponed or anticipated consumption, storage)
- **Flexibility services (potentially in collaboration with other smart districts):** battery storage or injection, offering power that can be uncoupled for a period of time (HP, pumping systems, energy for water sanitation, ...)
- Coordinate with other living labs to streamline requests on exceptions on regulation (VREG/Eandis)



18



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