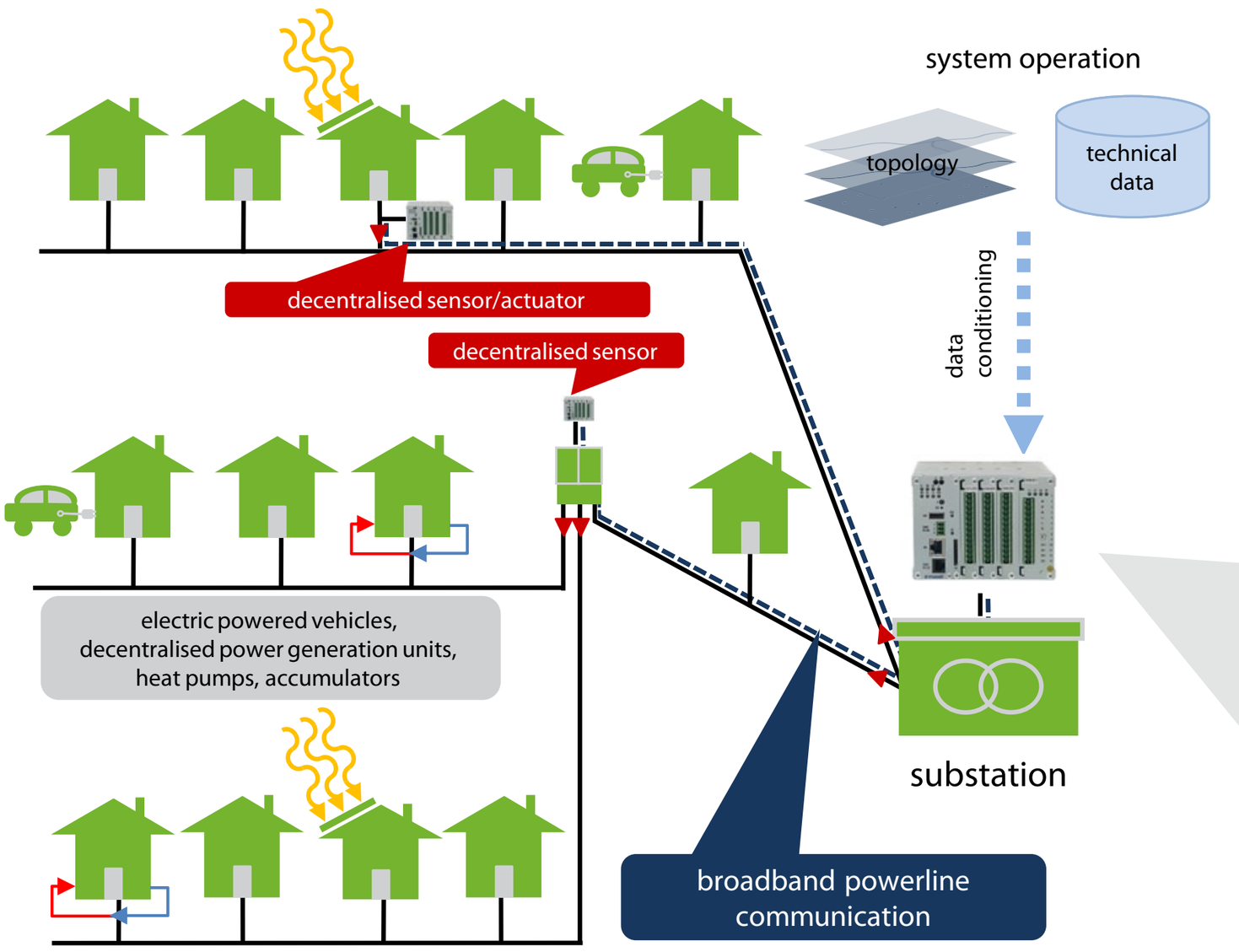
SMART CITIES

InnovationsAllianz
DER NRW-HOCHSCHULEN E.V.

SMART ELECTRICITY DISTRIBUTION GRIDS

In the last years the power supply systems in Europe changed dramatically and fundamentally. This concerns the generation of electrical power which switches from centralized generation to more decentralized renewable energy. Therefore especially the medium and low voltage grids near to the customers and the decentralized generation units face never-known changes nowadays. To overcome these problems a self-sustaining monitoring and control system for low voltage grids has been developed. This system monitors the actual power flow situation and controls individual decentralized generation units and consumer loads if necessary. The main component of the system is a new and cost-effective control unit (SmartRTU) installed near to the transformer substation. It periodically communicates with only few measurement and control sensors placed at neuralgic points in the grid. A new power flow algorithm is used to observe the actual grid status and to send out adjustment commands. The advantage of this solution is the optimal utilization of the existing low-voltage grid. Expensive grid enhancement can be avoided.



smart RTU
– automation intelligence–

self-sustaining monitoring and control of low voltage grids

grid monitoring

Low Voltage
Grid State Identification

grid control

determination of desired values for decentralised generation units and consumer loads

output:
- active & reactive power (PV)
- active power (consumer loads)

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