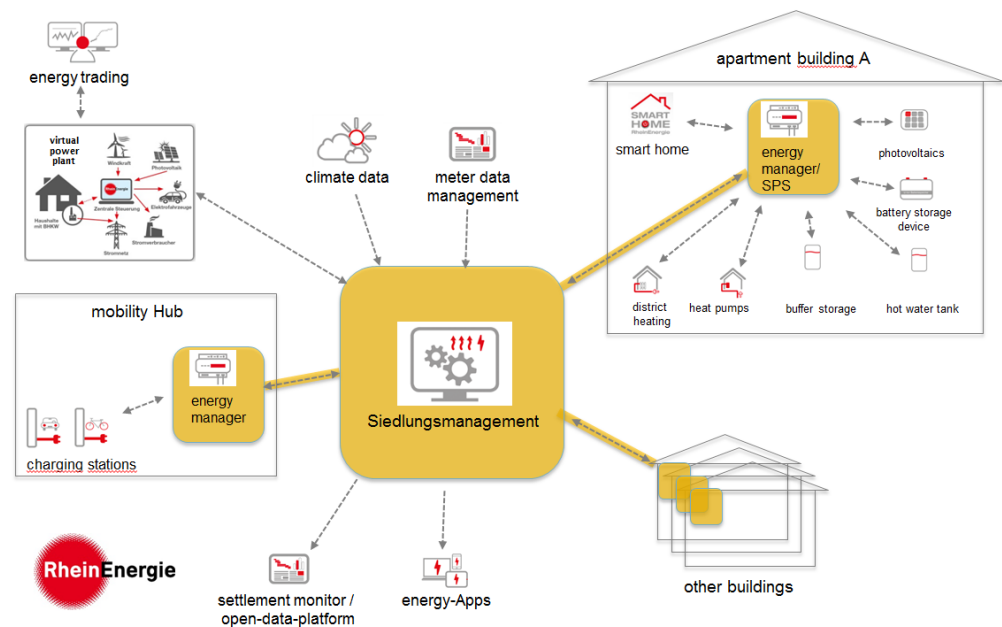


# Residential Estate Management

PART OF SMART SOLUTION 4: SMART LOCAL ELECTRICITY MANAGEMENT



LOW ENERGY DISTRICT

- Leads to a partly self-sufficient energy supply
- Reduces carbon emissions and improves air quality
- As a result of this solution less external energy has to be supplied, relieving pressure on energy grids



Cologne

Technical partner:

- Rheinenergie: [c.remacly@rheinenergie.com](mailto:c.remacly@rheinenergie.com)



## What is the solution?

The solution consists of a virtual power plant (Siedlungsmanagement) which connects local photovoltaic production, heat pumps and batteries. A charging station (solution 11) for electric vehicles (cars and pedelecs) will also be integrated into the settlement.

## How does it work?

Siedlungsmanagement is an intelligent management system to optimise energy and heat consumption. It interconnects internal (photovoltaic, heat pumps, battery storage) and external (district heat) energy producers.

Based on information gathered from meters installed throughout the building, Siedlungsmanagement can measure what energy is currently being used within each apartment and can predict future energy consumption. It uses this information to optimise the energy production and consumption in order to reduce the need for external energy from the grid.

The Siedlungsmanagement software optimises the operation of the systems based on the load forecast which is calculated using consumption and production data. For example, if the heating pumps are mainly supplied by photovoltaic during the project, the charging stations should be supplied by photovoltaic too.

The excess current should be saved in storage or fed into the public grid.

To avoid fluctuations in the network, the electric circuit is controlled by the Siedlungsmanagement software.

The electricity from photovoltaic panels is used mainly to supply the heat pumps. Any excess electricity will feed into the tenants' own power supply (Mieterstrom).

Once local electricity demand has been satisfied, any residual current will be fed into the grid and remunerated through the German renewable energy act EEG.

## Business Model Used

RheinEnergie is working on a business model to sell the Siedlungsmanagement system as a service. The software will only be available within Germany.

## Integration with other smart solutions

Smart Home from Solution 3 will be integrated into the Siedlungsmanagement system. Load management will be calculated using the Siedlungsmanagement software. Based on the load forecast, the Siedlungsmanagement software is aiming to achieve high levels of self-sufficiency and minimise the external energy supply.

## Expected Impact

The Siedlungsmanagement system meets the GrowSmarter aims in the following ways:

### **Reducing environmental impact:**

The intelligent load management of the Siedlungsmanagement system increases the degree of self-sufficiency in buildings which use it. This results in a lower demand for external energy, helping to reduce the burden on energy grids.

### **Promoting sustainable economic development:**

The ongoing energy revolution means that the electricity supply is going to be steadily decentralised. The virtual power plant supports this development, helping to replace coal and nuclear power plants with renewable energy systems and combined heat and power.

## Potential for replication

Siedlungsmanagement is a cutting edge automation technology for settlements and could easily be used as a blueprint for other cities. Siedlungsmanagement by RheinEnergie is currently only available within Germany.