



**PSsystemec GmbH**

**Solution & Usecases Cumulocity**

01.1/2026

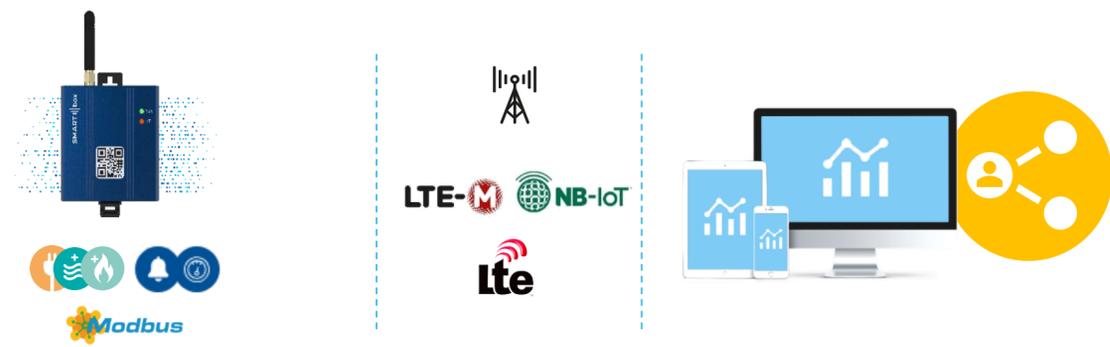


**We connect and digitize.  
Energy. Assets. Machines.**

## Our Mission

We enable **easy access** to **non-digitized data** anywhere and anytime.

PSsystemec develops **and produces the IoT system SMARTbox** for the fields of building and plant technology as well as energy and water management. Plug-and-play solutions, non-invasive, and manufacturer-independent technologies allow digitization in retrofit applications.



PSsystemec  
PSA-certified digitalization pathway

## Overview

- HQ: Augsburg/Germany
- Devices in the field: +50.000/year
- Inhouse: Development, Production, Logistics, Service

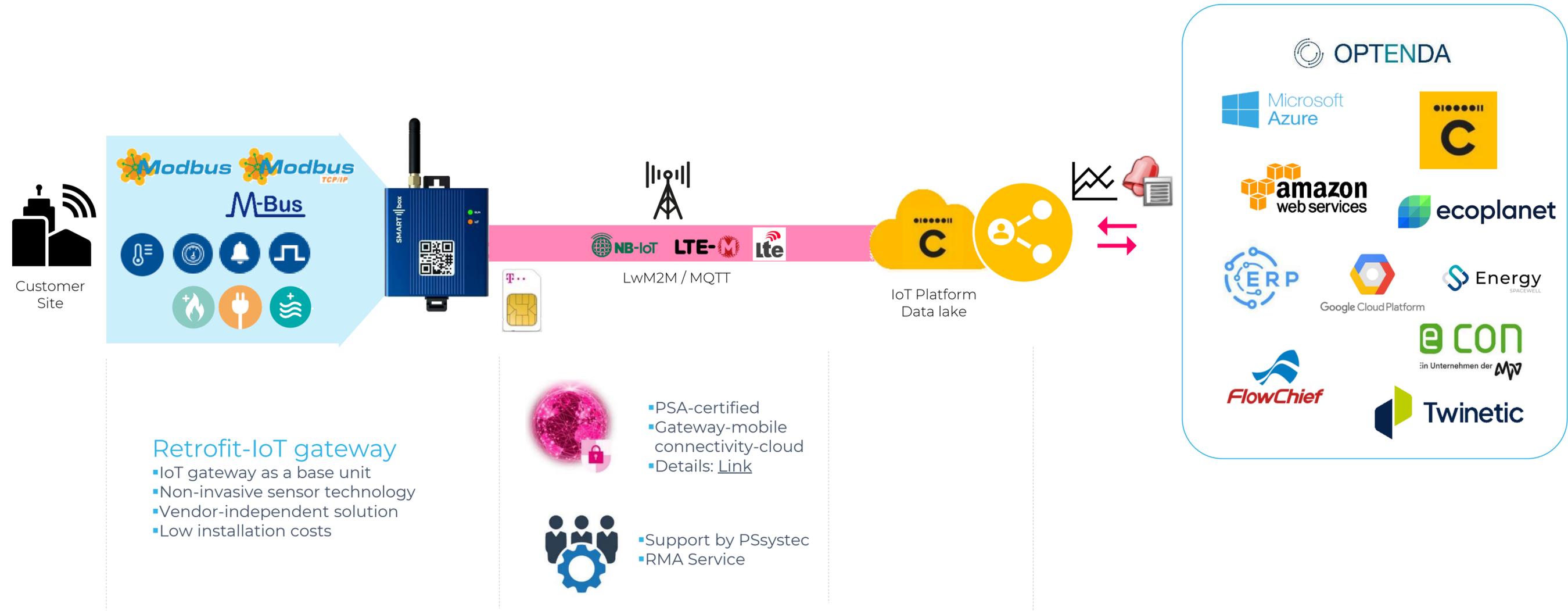
## Partner

- International distribution, technology and partner network
- 2014 Cumulocity
- 2016 Deutsche Telekom, Cloud of Things
- <https://www.pssystemec.com/partner>



**A<sup>1</sup> Digital**

# PSsystemec Technology & Business Model



- Retrofit-IoT gateway**
- IoT gateway as a base unit
  - Non-invasive sensor technology
  - Vendor-independent solution
  - Low installation costs

- PSA-certified
- Gateway-mobile connectivity-cloud
- Details: [Link](#)
- Support by PSystemec
- RMA Service

**ps||systemec**

SMARTservice		
SMARTcloud	Provided by Customer (SIM)	SMARTcloud
SMARToem	Provided by Customer (SIM + own Cloud) Custom development required	

# PSsystemec

## Challenges in the market

- Many plants in the field have so far been **digital "blind spots"** – IoT gateways enable the economic and comprehensive digitization of these locations for the first time.
- A central challenge of digitization is the large number of different, **manufacturer-dependent** devices and interfaces in the field.
- **2G will be switched off** in Germany by 2028 – a timely conversion to 4G/5G is necessary.
- Many systems are decentralized and lack IT infrastructure. Retrofitting IT is usually either too expensive or technically neither feasible nor practical..
- Industries:
  - [Water Management](#)
  - [Energy Industry](#)
  - [HVAC Technology](#)
  - [Infrastructure](#)
  - [Process Technology | Industry](#)
  - [Compressed Air Technology](#)



# PSsystem SMARTbox

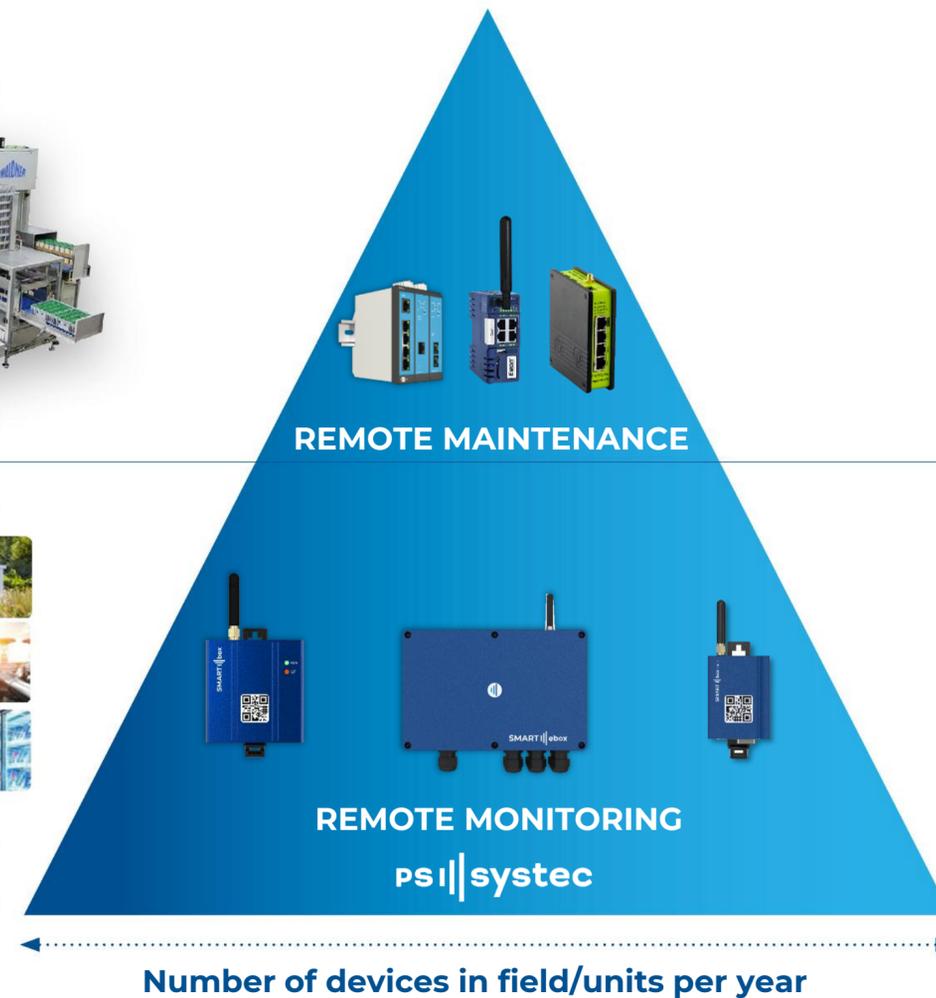


- Industrial-grade IoT gateway in a robust embedded design.
- Onboard connectivity with state-of-the-art wireless technology from satellite to NBIOT and LTE.
- Thanks to manufacturer-independent sensor and protocol interfaces, it enables customers to digitize plant technology worldwide using a non-invasive retrofit method.
- The system is ready for immediate use without any on-site configuration.
- REST API for integration into IT systems

Value/technical complexity



50k



Integrity

- Project planning
- IT integration

- Independent of IT
- Retrofit

# PSsystem

## Areas of application



Energy



Remote Monitoring



Energy consumption  
branch network



Monitoring  
decentralized  
infrastructure



Monitoring of  
pumping stations



Submetering  
gas and water



Monitoring  
water management



Remote monitoring  
of compressed air  
technology



Submetering  
electricity



Digitization of  
process sensor  
technology



Remote control  
of climate and  
refrigeration technology

# IoT Products Energy

## AC Measurement technology



**IoT Energymonitor Basic packages (10400.Sxx)**

- DIN rail mounting (optional as retrofit wall box) – 230V L1/N connection
- Pluggable transducers for any cross-section (20A-50A-100A-250A-400A-800A- Rogowski coils)



**Extension electricity OUT (10402.Sxx)**

- Extension of another control cabinet via wireless
- Pluggable converters for any cross-section (20A-50A-100A-250A-400A-800A)



**Extension electricity IN (10401.Sxx)**

- Extension IN control cabinet via RJ45 network cable
- Pluggable converters for any cross-section (20A-50A-100A-250A-400A-800A)

## DC Measurement technology



**SMARTebox DC**

- Degree of protection: IP65
- Power supply: -48 V DC / -60 V DC
- Connection of up to 128 DC extensions



**Expansion DC**

- Extension IN control cabinet via RJ45 network cable
- Pluggable converters for any cross-section (20A-50A-100A-250A-400A-800A)

## Gas-water/heat measurement technology



**Basic package gas (10400.Gxx)**

- Compatible with all common gas meters via pulse interface / no Mbus



**Basic package heat (80106.03)**

- DIN rail mounting (optional as retrofit wall box) – 230V L1/N connection
- Connection of up to 8 wired M-Bus subscribers
- Use in heat and current steels



**Basic package water (10400.Wxx)**

- Compatible with all common water meters via pulse interface

# IoT Products

## Remote monitoring

### Alarm signals and process management



**SMARTsensor Basis (10406.xx)**

- DIN rail
- Expandable to 40 IO's
- Pressure Sensors, Tank Sensor, 4..., 20mA, 0..10V, Digital, Pulse, Operating Hours
- Modbus RTU Master
- BLE



**SMARTsensor Outdoor SMARTebox BATT**

- IP65 /230V || Batt
- Pressure sensors, tank sensor over 4..., 20mA, 0..10V, Digital, Pulse, Operating Hours
- Modbus RTU Master
- BLE



### Modbus & BACnet



**SMARTmodbus (10408.Rxx)**

- Modbus RTU Master
- RS485 | Pulse input or Modbus TCP
- Max 400 data points, max 32 slaves



**thin-edge SMARTaccess (10408.Exx)**

- Modbus TCP Client
- BACnet Client
- Remote access by WebSSH



### Environmental Sensors



**SMARTebox BLE (70934.02)**

- BLE scanning to device up to 80 BLE sensors

### Power failure

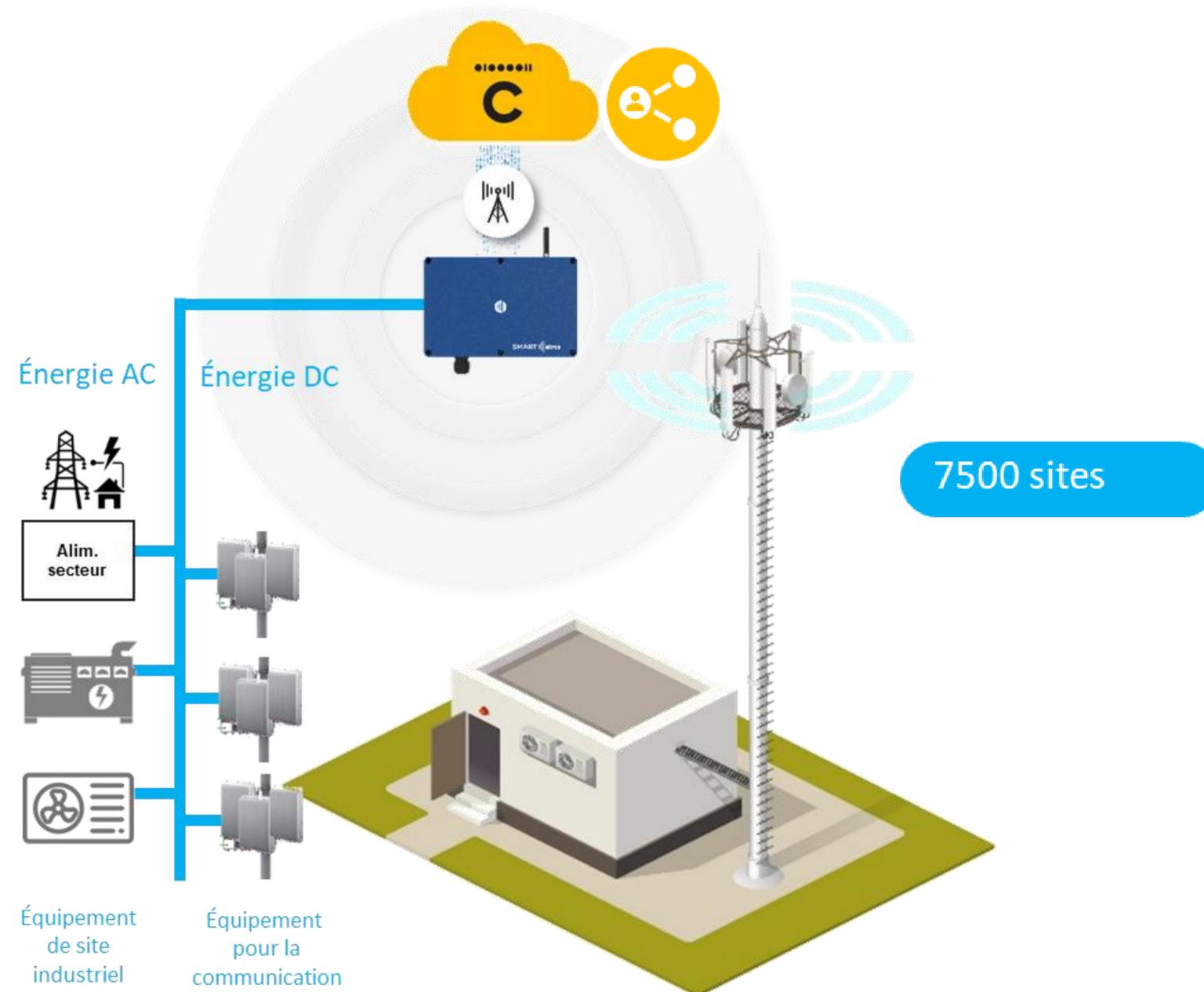


**SMARTsocket (80108)**

- 115/230V
- Measurement: Voltage failure with internal power buffer technology
- Anomaly detection
- Remote On/Off

# Energy management for mobile network base stations

## Energy Use Efficiency (EUE) Assessment



### Key Metrics

- IoT-driven solution for EUE monitoring
- Plug-and-play IoT gateways for seamless retrofitting
- Over 7,500 sites in Germany
- Over 80,000 AC/DC energy measurement points
- Secure devices that are certified by 
- No local IT integration is necessary; NO VPN is required due to mobile connectivity.

# Alarm management in critical infrastructure

## Solution Internet of Things



### Key Metrics

- IoT-enabled tracking for alarm management
- 1,800 sites across Germany
- Over 12 million data points have been monitored.
- Secure devices that are certified by 
- Plug-and-play IoT gateways for seamless retrofitting
- 24/7 real-time alarm oversight for uninterrupted monitoring
- 70% reduction in operating expenses by transitioning from VPN to LTE

# Monitoring of oil and gas system operations in Southern Europe Solution Internet of Things



## Key Metrics

- IoT-enabled monitoring for the oil and gas industry
- Over 2,000 gas systems are being monitored throughout Europe.
- Real-time surveillance across all locations,
- no local IT integration necessary
- Secure devices that are certified by 
- Accelerated fault detection through precise error reporting
- Continuous monitoring to guarantee optimal operational reliability.

# Connect Wireless ( 868 Mhz ) Portable Gas Detection System

Monitoring



Remote Maintenance



Web SSH



**Cumulocity Platform  
Using Cloud Fieldbus**



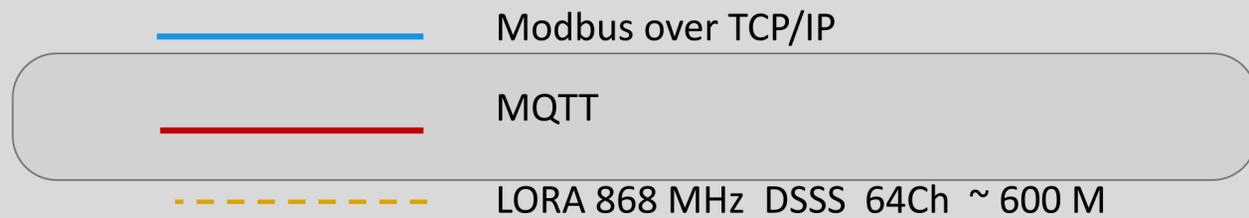
**SMARTbox Mini ETH  
(SMARTmodbus)**



**LORA GATEWAY  
HONEYWELL CERTRAL HUB**



**MicroRae  
LoRa Gas  
Sensor**



## Surveillance of potable and wastewater Solution Internet of Things



### Key Metrics

- IoT-enabled monitoring system for potable and wastewater
- 100,000 sites under surveillance
- 1,900 km of pipeline network encompassed
- 100 technicians responsible for maintenance
- Plug-and-play IoT gateways for seamless retrofitting
- Proactive leak identification
- 30% decrease in operating expenses through automation and efficiency.
- Real-time monitoring for enhanced maintenance and expedited problem resolution.
- Secure devices that are certified by 
- Sustainability: Mitigating water losses and minimizing infrastructure damage



Horst LANGE  
Head of Sales

T: +49 821 319724-126

M: +49 172 7272282

Email: [horst.lange@pssystemec.com](mailto:horst.lange@pssystemec.com)



[www.pssystemec.com](http://www.pssystemec.com)

PSsystemec GmbH // Design & Production SMARTbox

Alter Postweg 94A // 86159 Augsburg // Phone: +49 821 31972400 // E-Mail: [sales@pssystemec.com](mailto:sales@pssystemec.com)

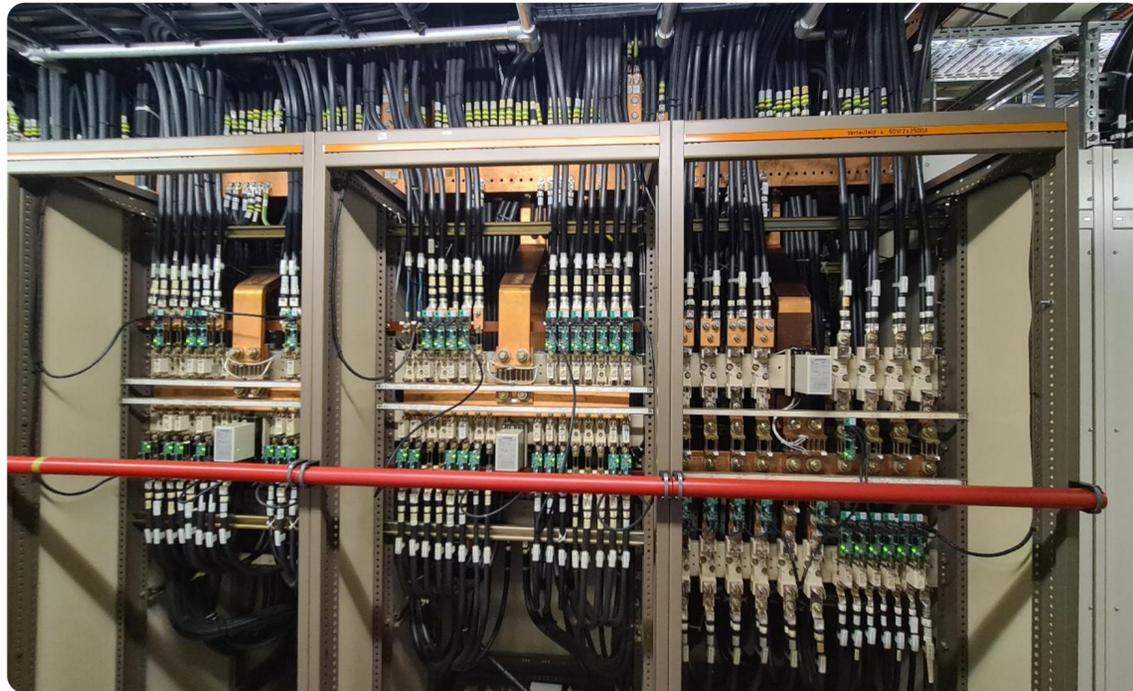
# Energy Industry

10 kV



# Energy Industry

## AC-DC Monitoring Base Stations

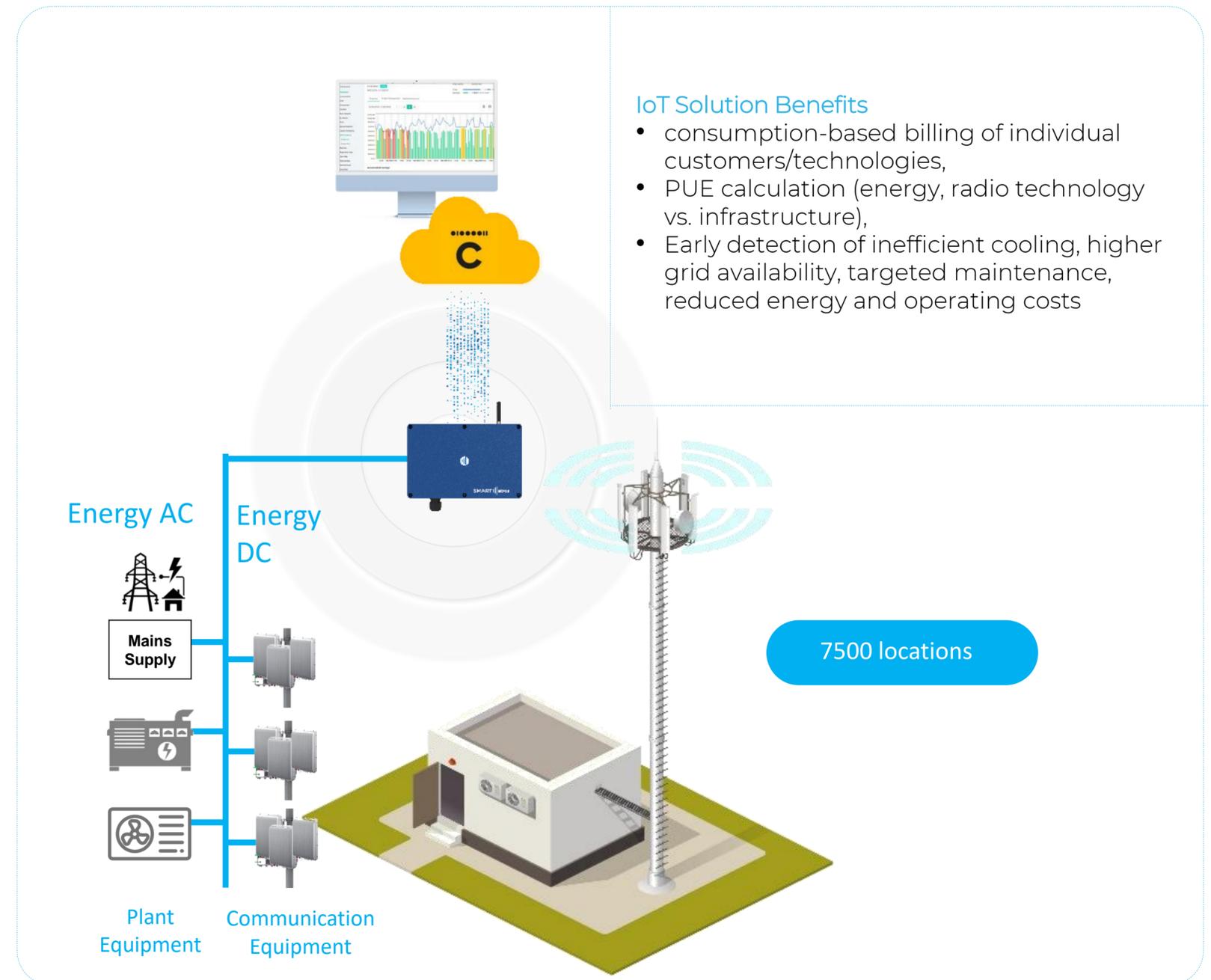


### Application

- Mobile sites are critical infrastructure with high energy requirements. Multiple tenants/technologies (2G–5G, private networks) often share a location. Without separate metering, consumption-based billing, energy optimization and PUE evaluation are not possible.
- At the same time, creeping problems in AC, DC or battery systems lead to failures.

### Technical infrastructure

- Measurement at defined energy points of the base station:
- AC feed-in point of the station (total consumption)
- AC outlets for cooling/air conditioning
- DC outputs per radio technology or customer (e.g. 4G, 5G, tenant A/B)
- Battery Strings / UPS Outlets in the Technology Cabinet



# Energy Industry

## Network wipers & network quality

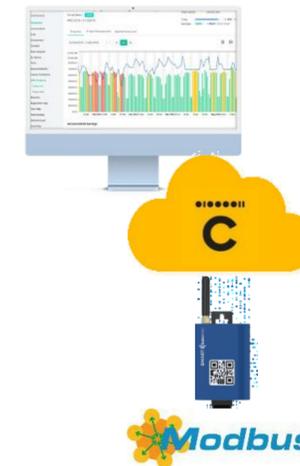


### Application

- Short-term voltage dips ("network sweepers") and quality problems lead to plant shutdowns, IT disruptions and production losses.
- Without targeted PQ measurement, it is not possible to clearly clarify the cause (network vs. customer system).

### Technical infrastructure

- Measurement at the defined grid connection point: e.g. LV outlet of the local network station, MV/LV transformer outlet, main distribution board (NSHV) in the building, feed-in point industrial plant, critical consumer outlet (e.g. data center, production line)



Janitza UMG 806 (UL)  
Energy Analyzer



### IoT Solution Benefits

- Clear proof of network wipers, clear demarcation between network and customer cause,
- Objective evaluation of power quality, faster fault analysis, reliable proof of quality according to EN 50160



- Voltage & Current (RMS, Min/Max), Frequency,
- active/reactive/apparent power,  $\cos \varphi$ , voltage dips (sags),
- Voltage rises (swells), short interruptions, THD-U / THD-I,
- Single harmonic, asymmetry, EN 50160 rating

# Energy Industry

## Load curves transformer station and distribution network

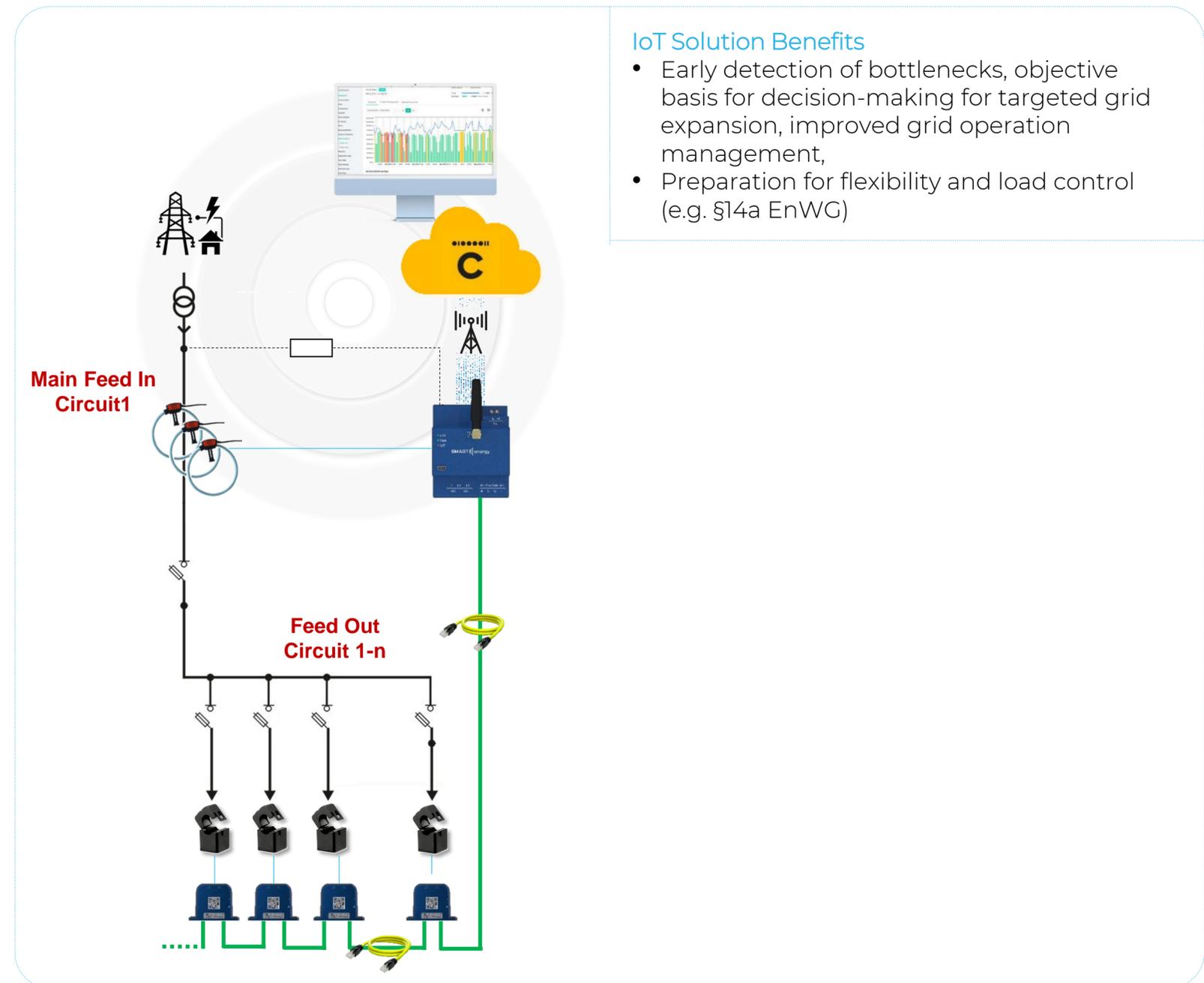


### Application

- PV feed-in, e-mobility and heat pumps cause dynamic and time-concentrated load peaks.
- Without continuous measurements, the low-voltage grid is "flying blind" in terms of capacity utilization and voltage quality.

### Technical infrastructure

- Measurement at the LV outlet of the local network station (per outlet/feeder), optionally also busbar or transformer LV side; If required, additional ward room temperature for thermal evaluation



### IoT Solution Benefits

- Early detection of bottlenecks, objective basis for decision-making for targeted grid expansion, improved grid operation management,
- Preparation for flexibility and load control (e.g. §14a EnWG)

# Energy Industry

## Earth and short-circuit detectors Transformer protection

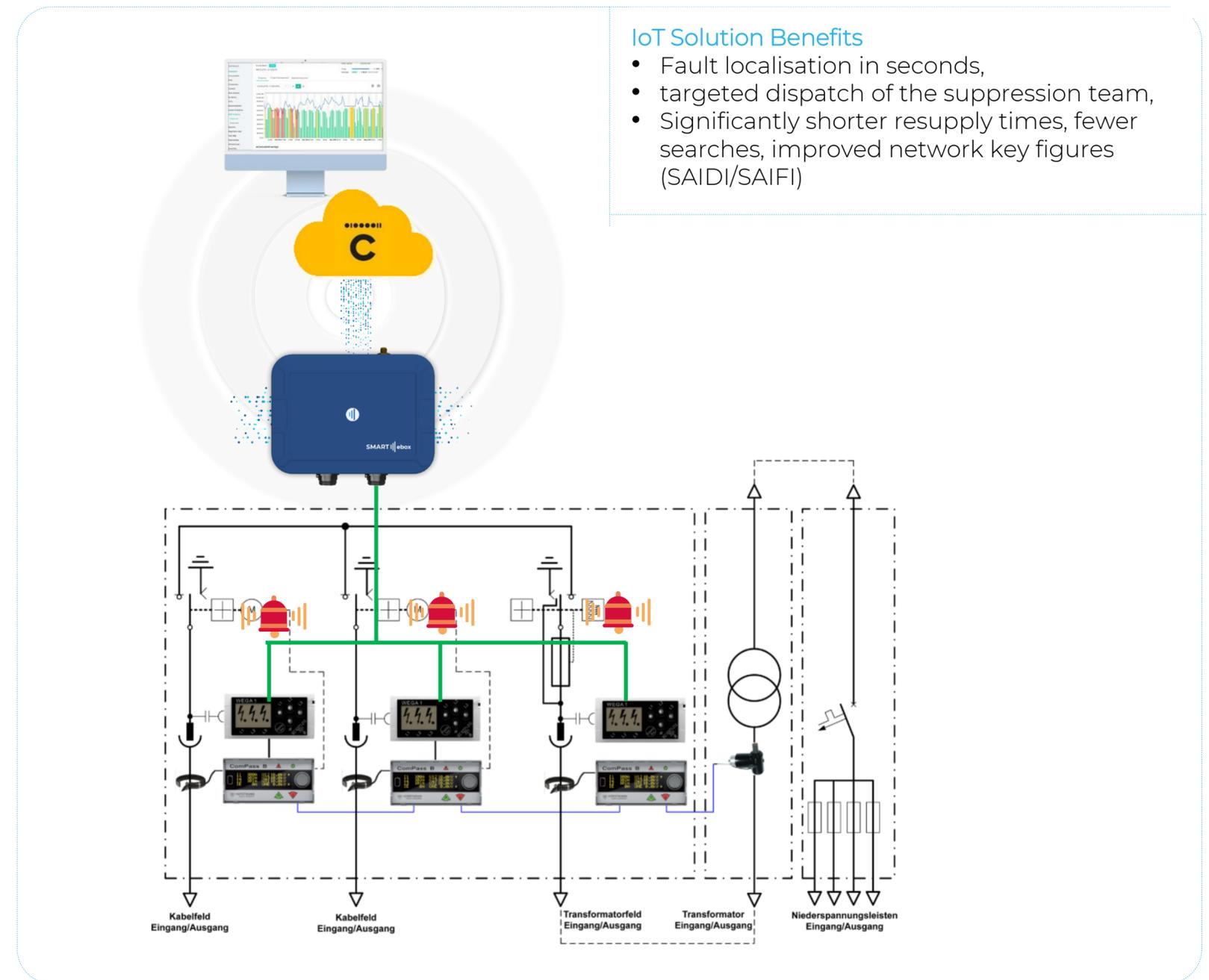


### Application

- Short circuits in the medium or low-voltage grid lead to tripping and supply interruptions.
- Without remote notification, fitters have to travel to several stations to find the fault location – this extends fault clearance times and worsens SAIDI/SAIFI.

### Technical infrastructure

- Short circuit event (trip), direction of the fault (forward/backward), affected phase(s), optional ground fault indication, timestamp of the event



# Energy Industry

## PV-Inverter-Monitoring (Photovoltaik)

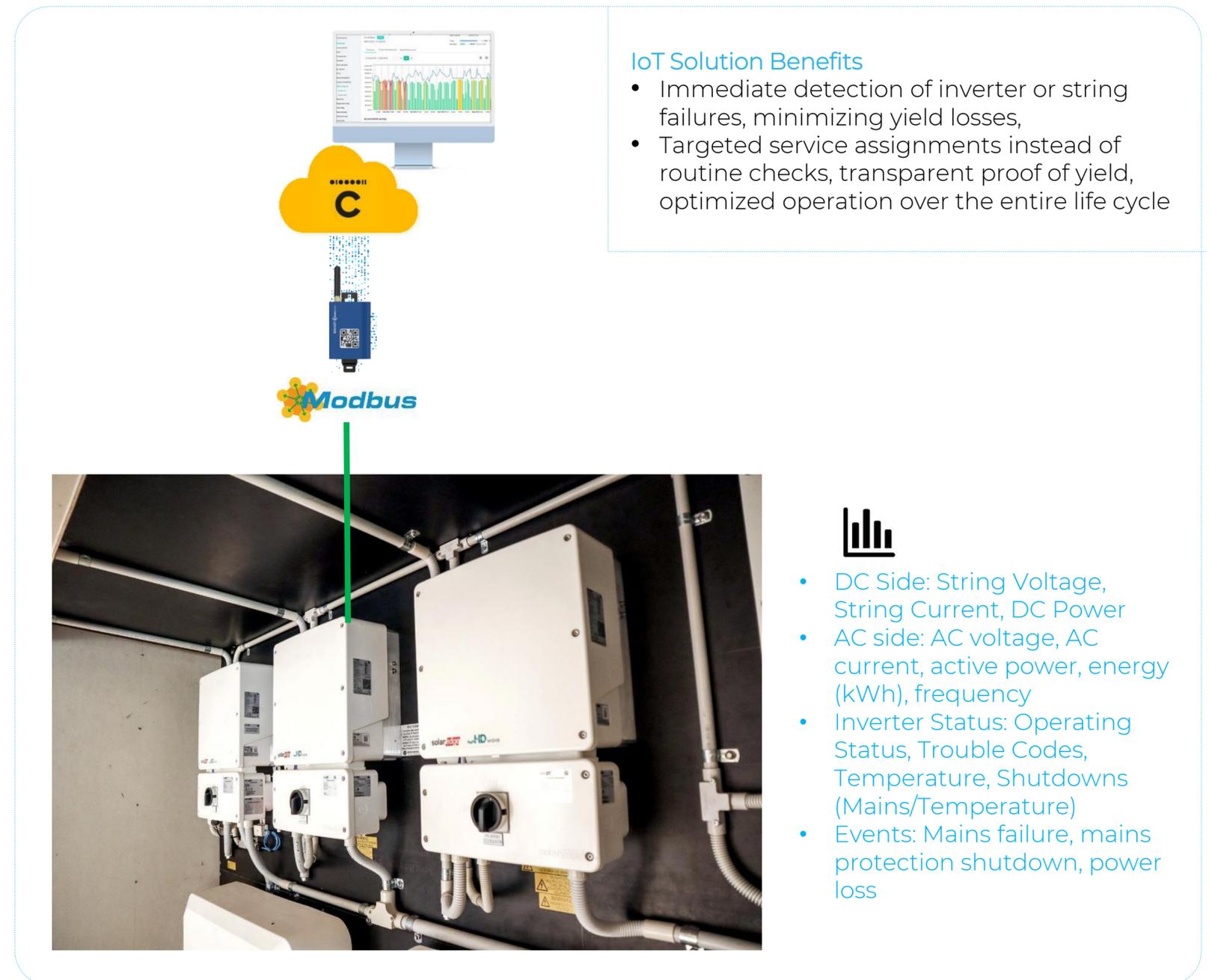


### Application

- PV systems are often decentralized, unoccupied and economically heavily dependent on continuous yield.
- Inverter errors, string failures, overtemperature or grid shutdowns often remain undetected for a long time without monitoring and lead to yield losses.

### Technical infrastructure

- Measurement directly on the PV inverter master:
- Modbus RTU or Modbus TCP
- Optional per inverter or per string for larger systems



# Energy Management



# Energy Management Energy monitoring Buildings and Branch Networks

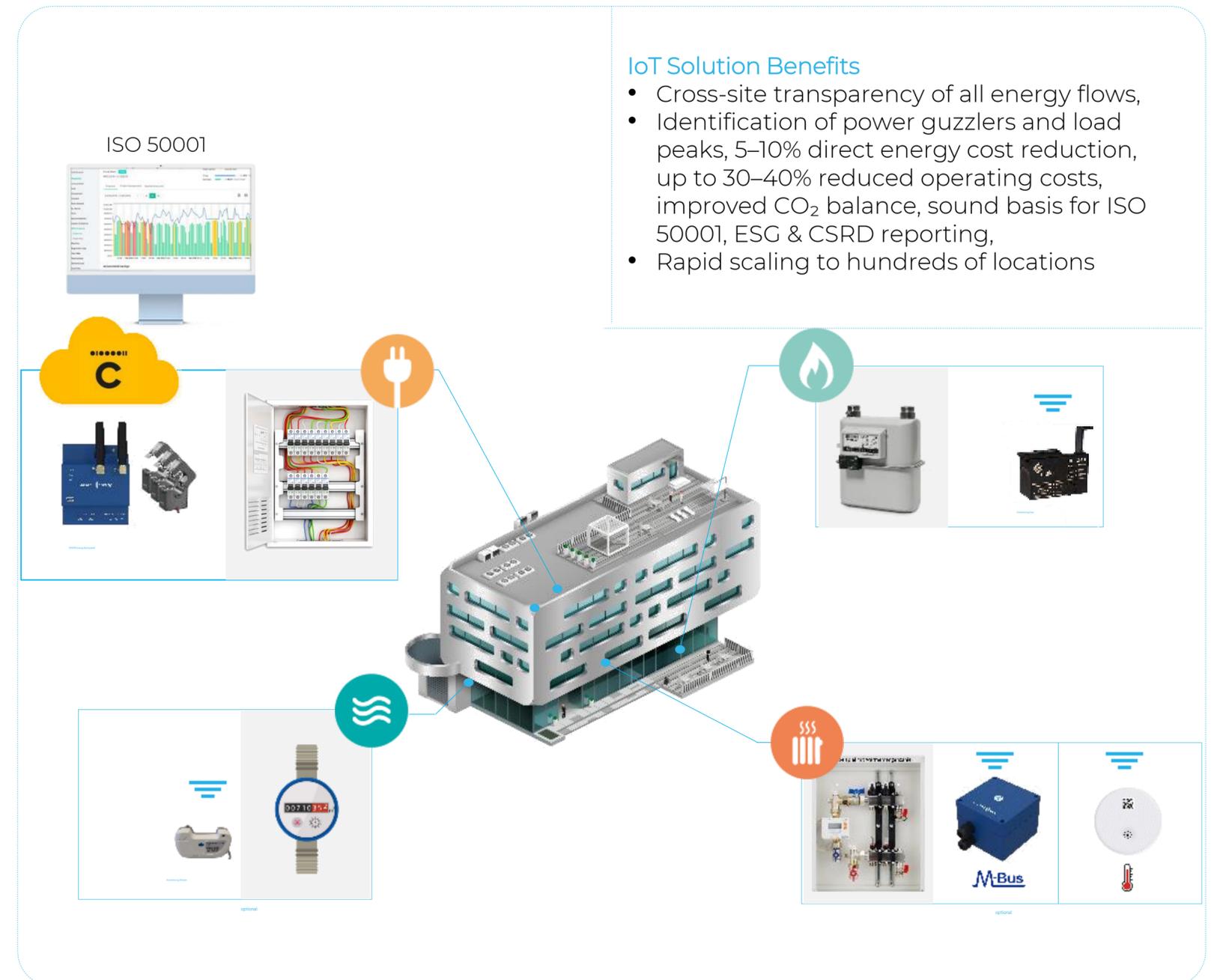


## Application

- Large branch networks (>600 locations) suffer from high energy costs, a lack of transparency about energy consumption and an insufficient database for energy optimization, ESG and CSRD reporting. Main consumers such as cooling systems, air conditioning, lighting cause load peaks and unnecessary base loads.
- Different building structures and leases prevent traditional IT integration.

## Technical infrastructure

- Electricity load profiles (15 min values), gas, heat and water consumption, temperature (sales area, warehouse, cash registers), load peaks, base loads,
- Operating times of energy-intensive systems



# Energy Management Industry – Peak Shaving

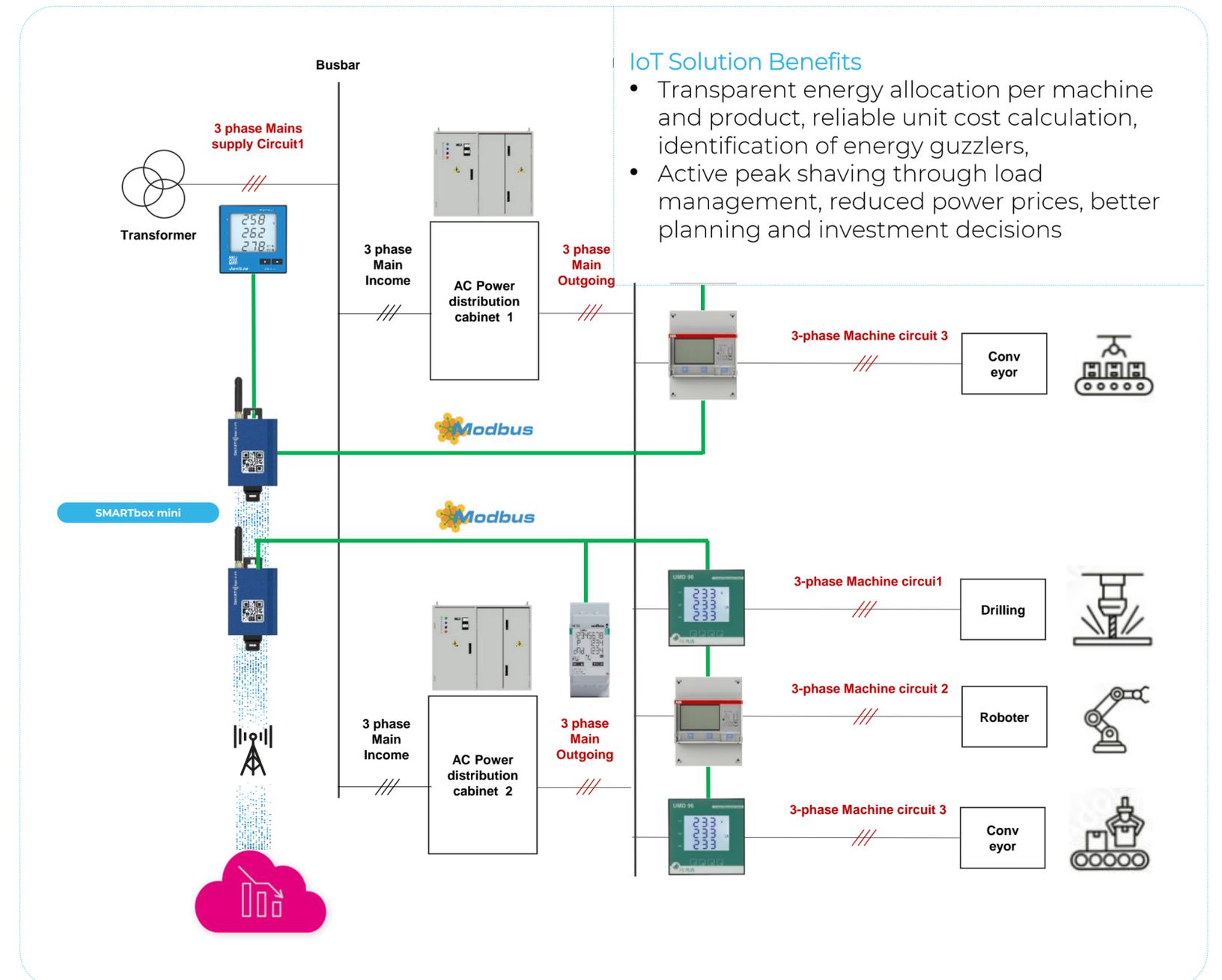


## Application

- In production companies, energy costs are a significant cost factor. Without detailed measurement, it is unclear how much energy individual machines or products actually consume.
- At the same time, load peaks lead to high power prices. Classic meters only provide total values and no production-related transparency.

## Technical infrastructure

- Electrical power (kW), energy (kWh), load profiles (e.g. 1–15 min), machine status (on/off/load), production quantities / cycles (optional), peak events (power peaks)



# Energy Management Residential Real Estate – Energy Management

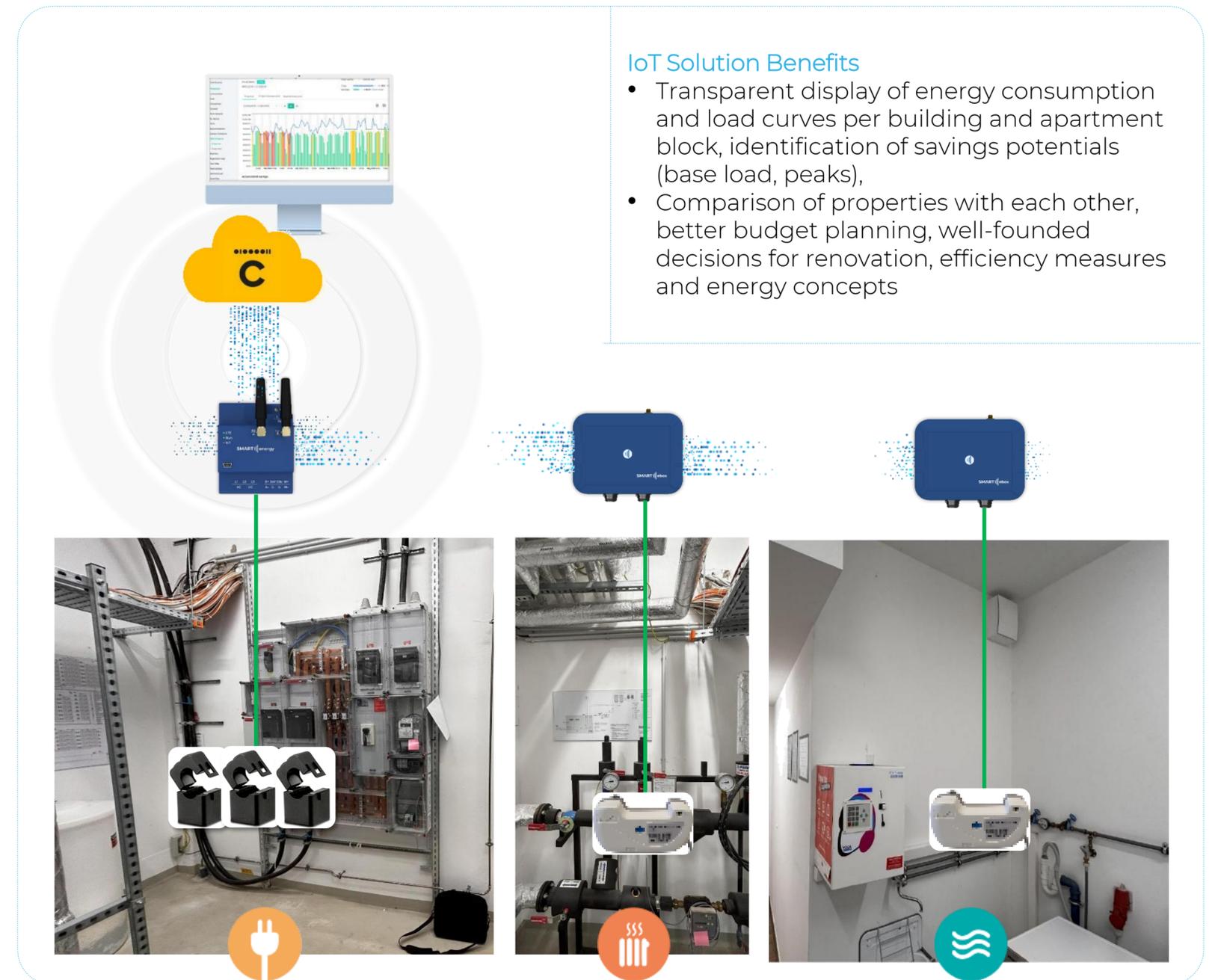


## Application

- Residential properties cause rising energy and operating costs. Owners, managers and energy managers have no
- Overall overview of load curves, base loads and consumption development of individual buildings or entire apartment blocks. Without a central database, optimization, comparison and strategic decisions are hardly possible.

## Technical infrastructure

- Total electricity consumption, heat consumption, load profiles (e.g. 15 min values), base load, peak loads, operating times of community consumers, consumption trends



# Infrastructure



# Infrastructure

## Critical Infrastructure Alarm Management



### Application

- Critical infrastructures consist of many distributed, unoccupied locations.
- Individual alarms (air conditioning, energy, battery, generator) often occur in separate systems or are not detected at all.
- Lack of prioritization leads to a flood of alarms or delayed reactions.

### Technical infrastructure

- Monitoring at all critical functional points of a site:
- AC feed-in point (grid status) – DC distribution / -48 V bus (radio technology supply)
- Battery Strings (Backup Power)
- Diesel emergency generator (emergency supply)
- Air conditioning / technical room (ambient conditions)
- Access points (closet, shelter, room)



### IoT Solution Benefits

- 24/7 real-time alarm management for continuous monitoring
- 70% reduction in operational costs by switching from VPN to LTE
- Centralized, cross-site alerting in real time, clear prioritization (critical vs. informative),
- faster fault clearance, fewer unplanned outages,
- Reduced operating costs due to reduced on-site visits

# Infrastructure

## Pressure, gas and level monitoring



### Application

- Distributed pressure and gas systems (e.g. gas tanks, cryogenic tanks, pressure control systems) are often only checked locally or periodically.
- Unknown fill levels, pressure deviations or leaks lead to supply risks, safety problems and inefficient scheduling.

### Technical infrastructure

- Level (continuous or limits), pressure, temperature, flow rate (optional),
- Operating states, leakage signals, alarm and fault contacts



# Infrastructure

## Air conditioning technology for technical and server rooms (HVAC)

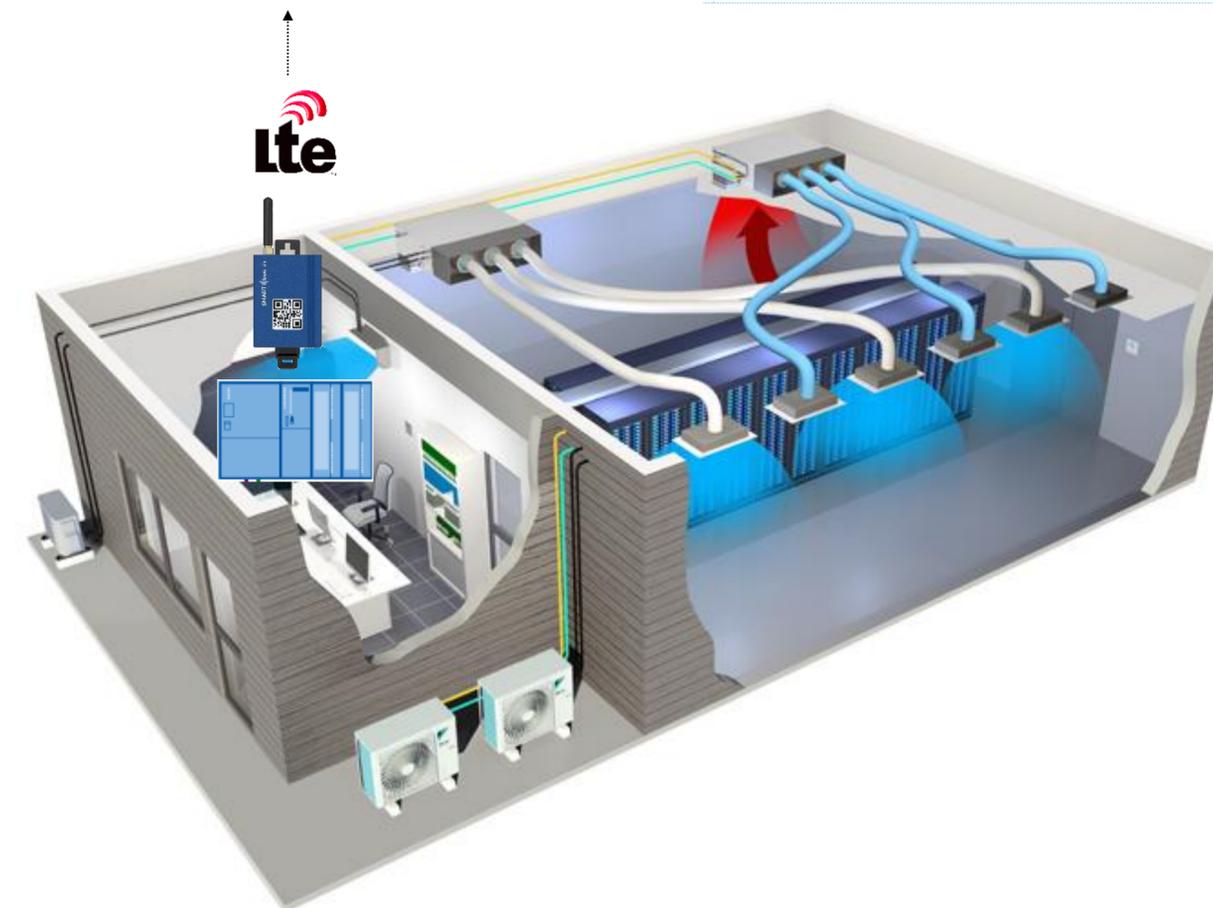


### Application

- Technical and server rooms require permanently stable climate conditions. Faults (air conditioning unit failed, valve jammed, sensor drifts, wrong parameters) quickly lead to overtemperature and system shutdowns.
- Without remote access, a technician must be on-site for any adjustment or analysis.

### Technical infrastructure

- Room and supply air temperature, humidity, differential pressure (filter/air flow), device status (air conditioner, fan, compressor), alarms (overtemperature, frost protection, device failure), operating hours



### IoT Solution Benefits

- Early detection of critical climate conditions, remote diagnostics and remote parameterization (setpoints, time programs, reset),
- Faster troubleshooting without on-site intervention, higher system availability, lower operating costs and stable 24/7 operation

# Infrastructure

## Diesel emergency power generators

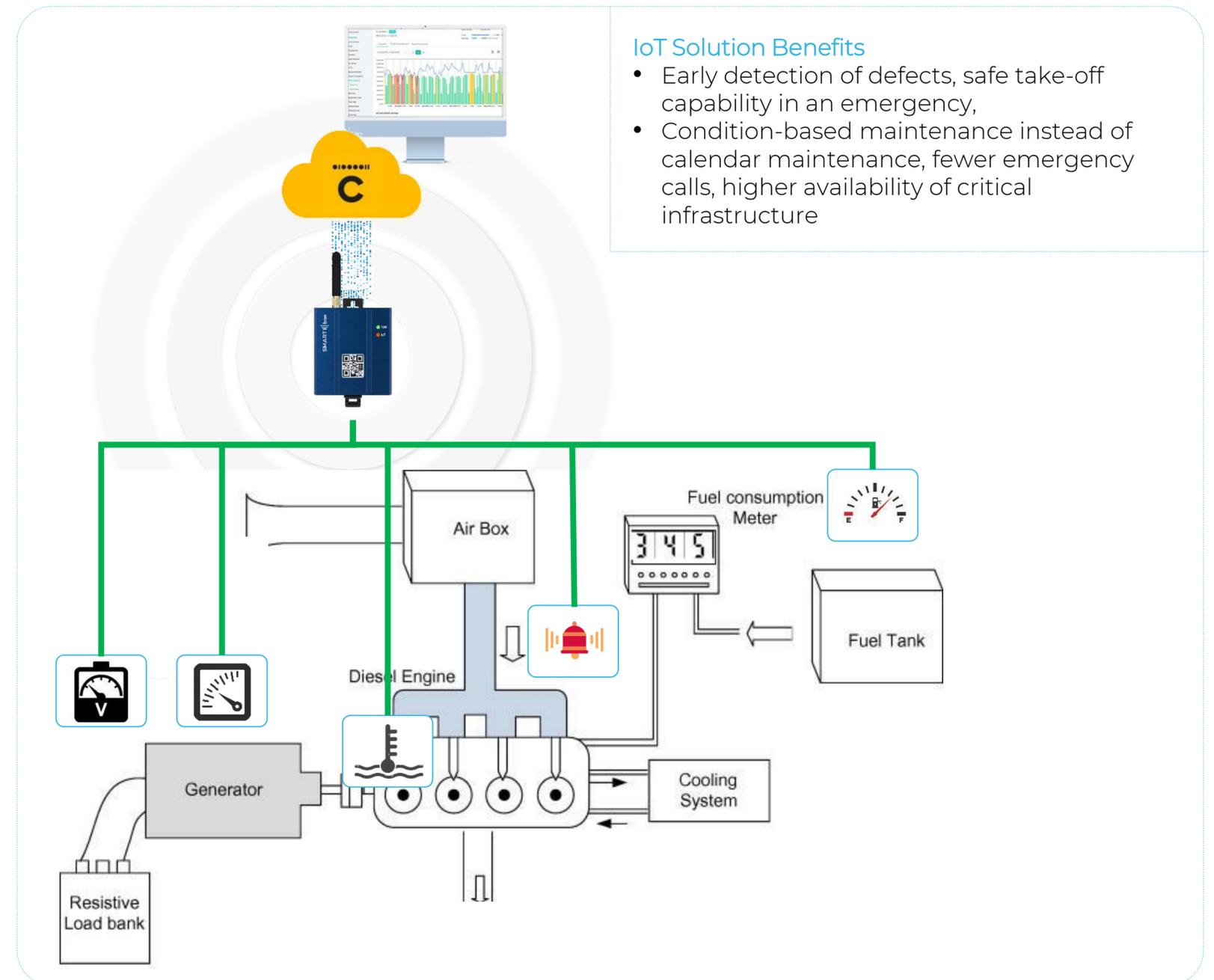


### Application

- Diesel emergency generators are rarely operated, but must start reliably immediately in an emergency.
- Typical problems such as empty starting batteries, outdated fuel, cooling or low oil levels remain undetected without monitoring and lead to failure in the event of a power failure.

### Technical infrastructure

- Engine: Oil temperature, oil pressure, coolant temperature, speed
- Fuel: Level, Consumption, Leakage (optional)
- Electrical: Generator Voltage, Current, Frequency, Power
- Operation: Running hours, start/false starts, alarm status



# Infrastructure

## District heating systems (heating centres & networks)

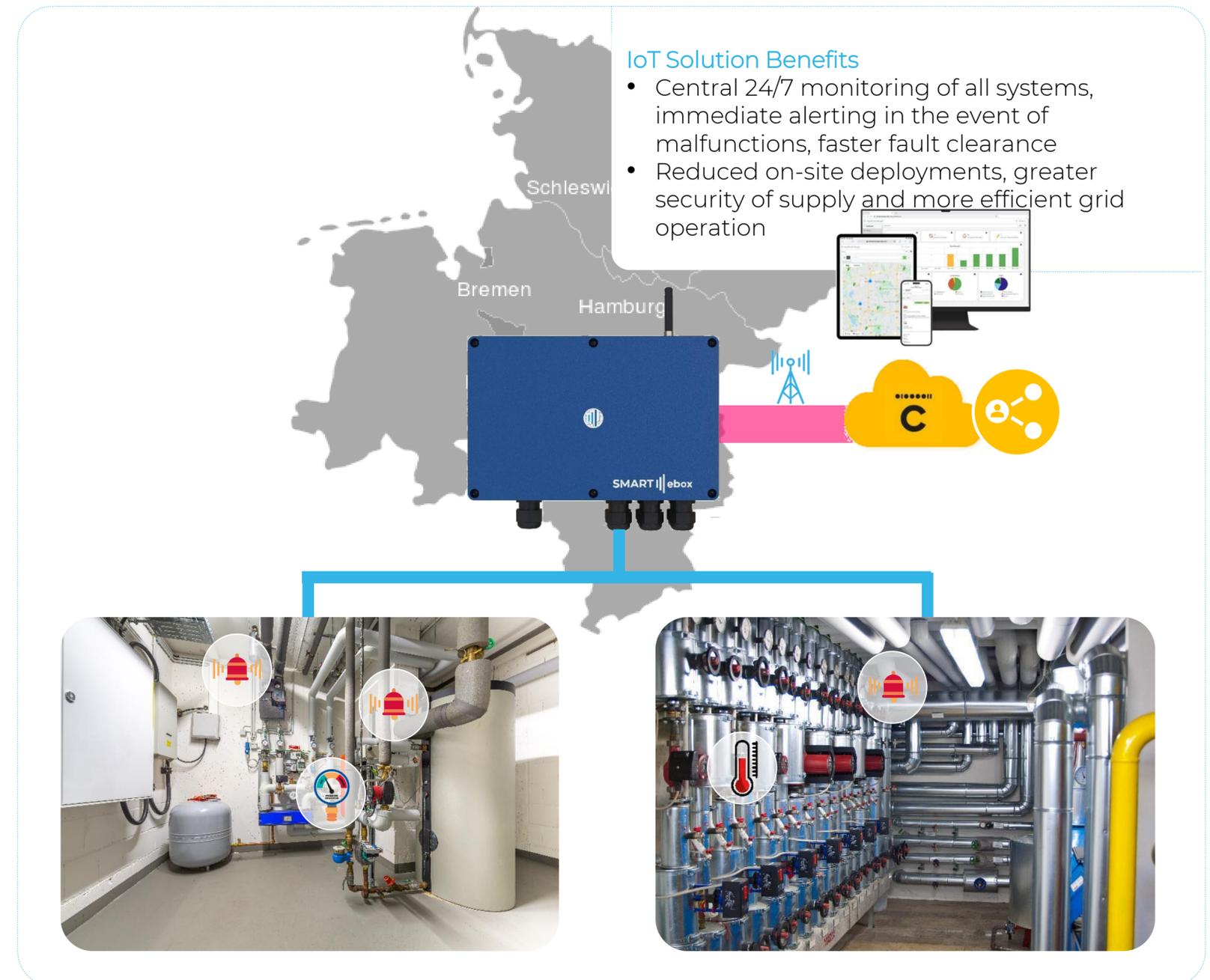


### Application

- District heating plants consist of many decentralized, mostly unmanned heating centers and transfer stations. Faults (pump failure, pressure drop, temperature deviation) are often only detected by customer reports. A lack of transparency makes rapid fault clearance more difficult and increases operating costs.

### Technical infrastructure

- Supply and return temperature, system pressure, flow, pump status, valve positions, heat quantity,
- Fill levels (e.g. expansion tank), fault and alarm contacts (boiler, burner, pump)



# Infrastructure

## Critical IT nodes (e.g., edge routers)

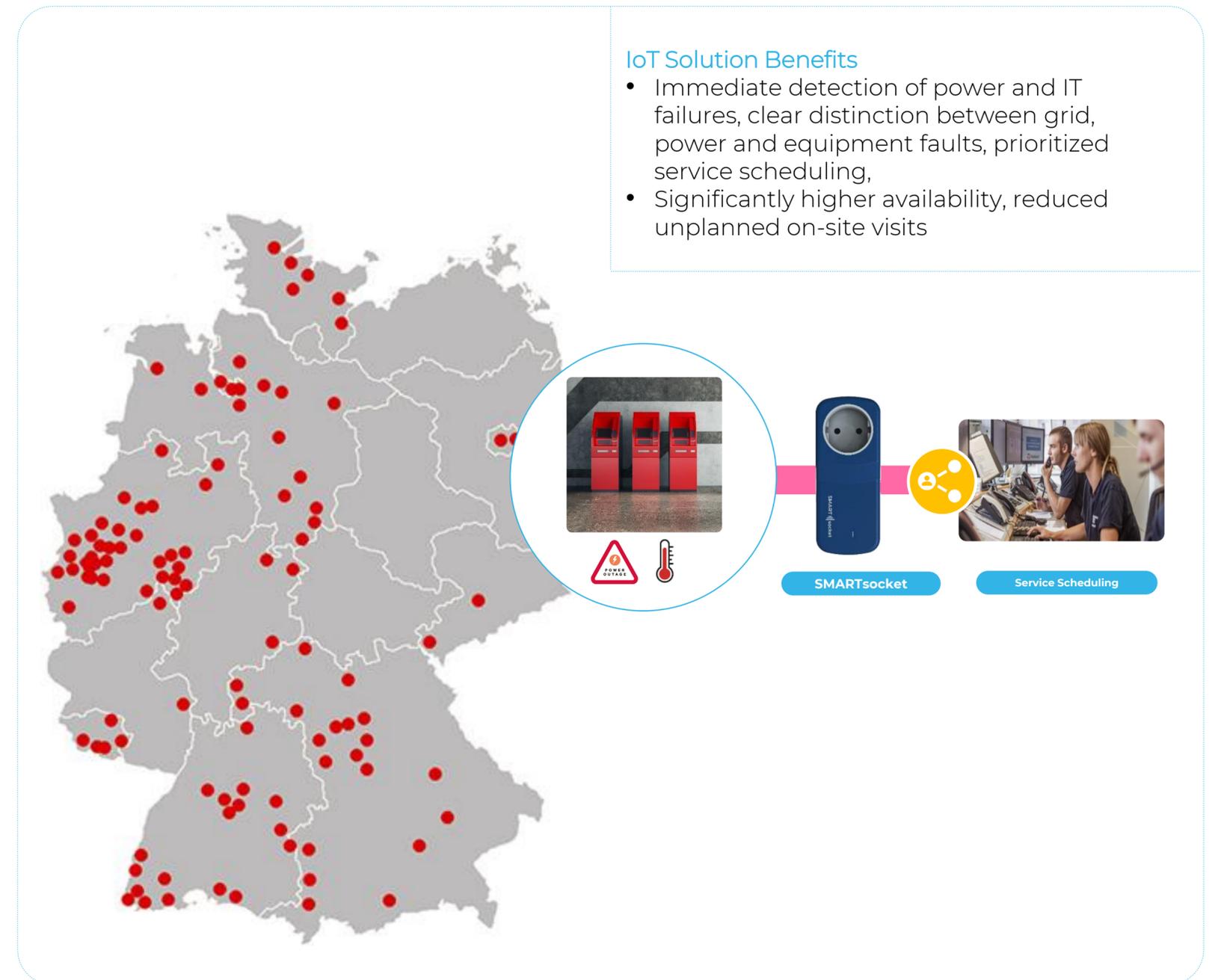


### Application

- Critical IT systems such as ATMs, self-service terminals or edge IT nodes are distributed in a decentralized manner and are often unmanned. Power outages, grid problems or overtemperature lead directly to unavailability.
- Without independent monitoring, disruptions are often only reported by customers.

### Technical infrastructure

- Mains voltage present / failed, current consumption (on/off), temperature in the device environment, status of IT system (heartbeat), communication status, events (power loss, return)



## Infrastructure

# Temperature monitoring multifunctional housing (telecom infrastructure)

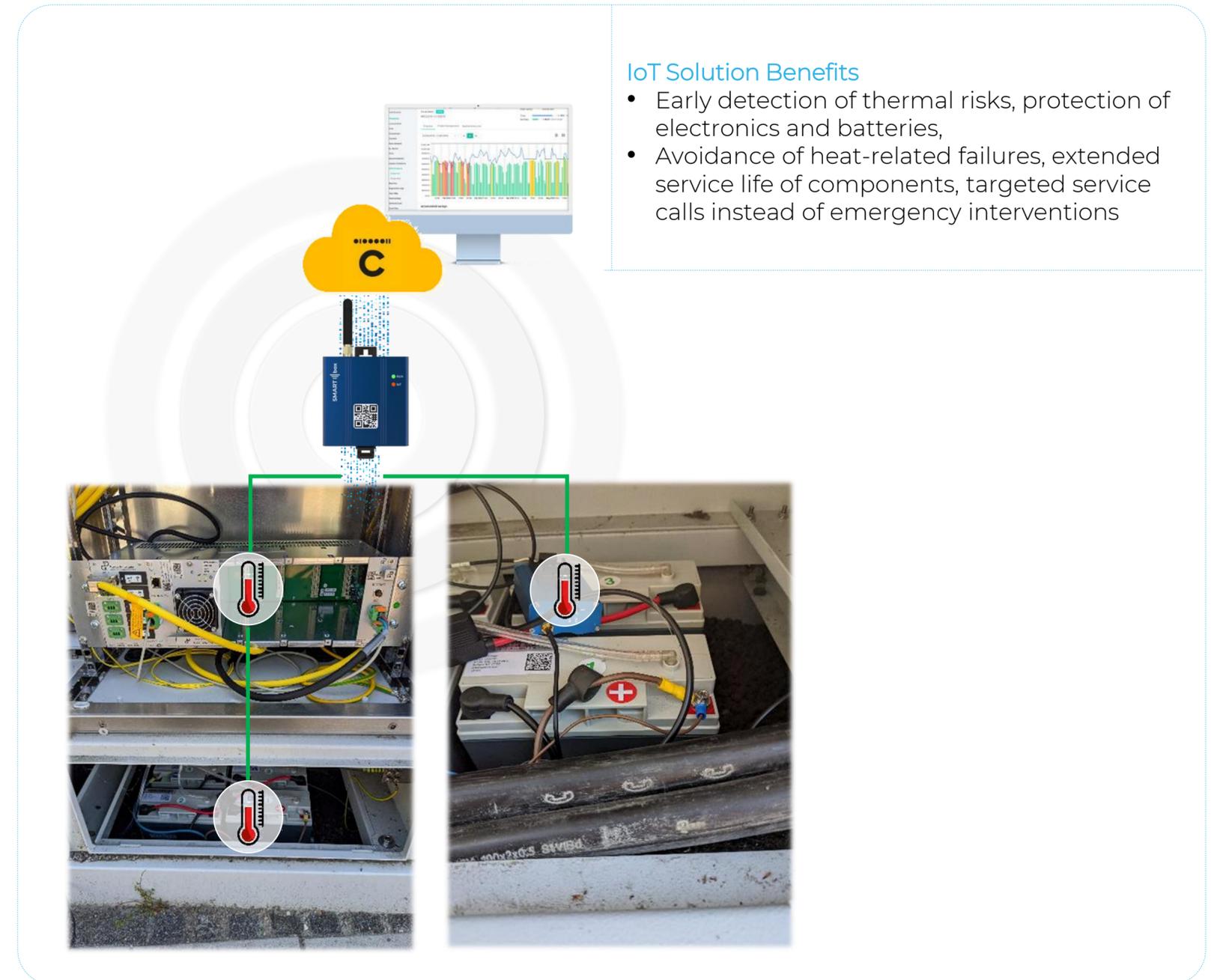


### Application

- Multifunctional enclosures house active technology, power supply, batteries and network components and are usually installed unmanned outdoors.
- Overtemperature due to solar radiation, defective fans or insufficient ventilation leads to failures, accelerated aging of the components or battery defects. Without monitoring, critical conditions remain undetected.

### Technical infrastructure

- Indoor temperature (absolute & trend), temperature at hotspots
- (power supply, battery, electronics),
- Limit value exceedances, alarm status (over/under temperature)



# Infrastructure

## Mobile heating systems (construction drying / screed)

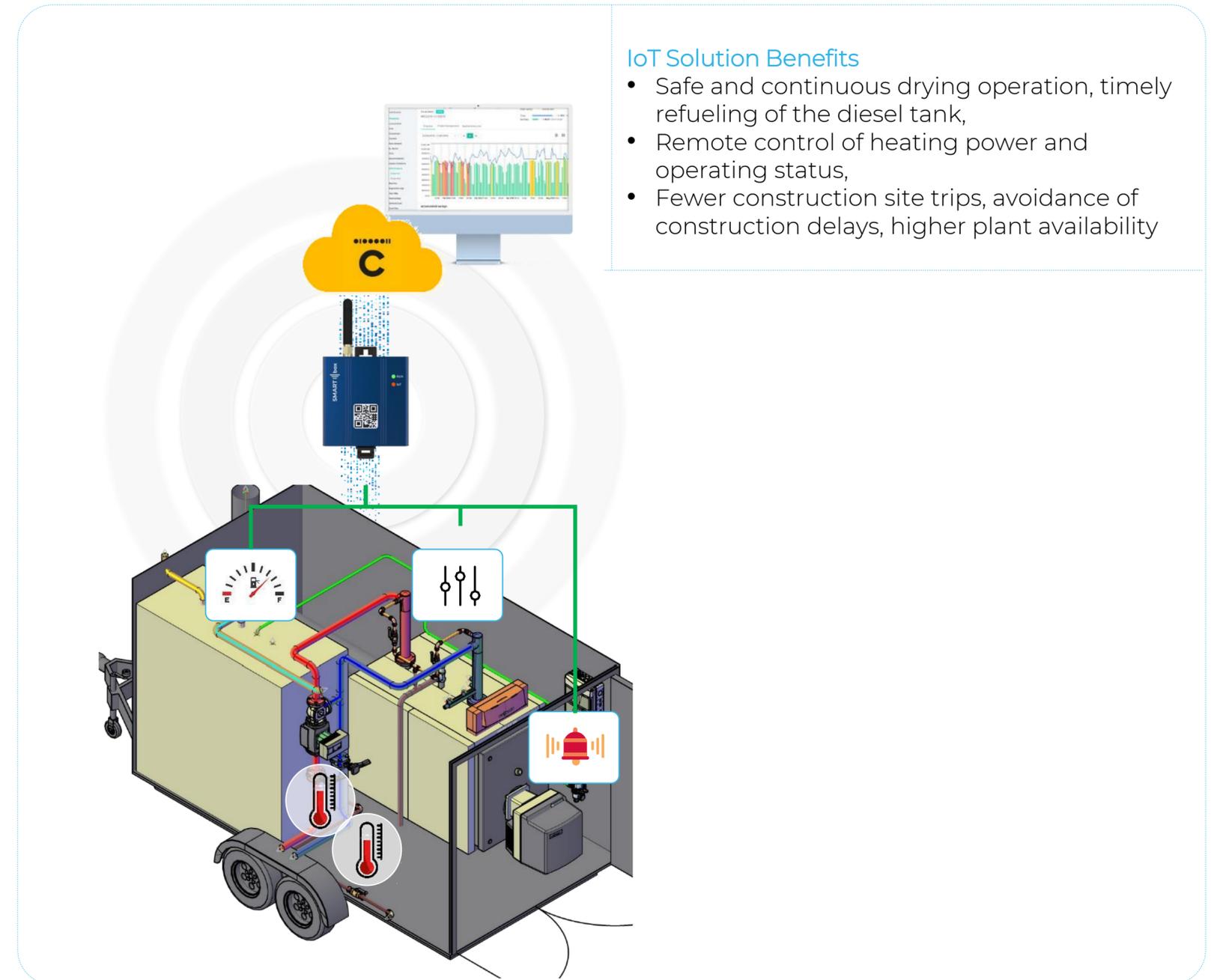


### Application

- Mobile heating units are used on construction sites for a limited period of time and often run unattended. Diesel shortage, burner malfunctions, Diesel shortage, burner malfunctions,
- Temperature deviations or failures jeopardize the drying process and delay construction times. Manual controls are inefficient and often too late.

### Technical infrastructure

- Heating water temperature (flow/return), burner operating status, fault messages,
- Diesel tank level,
- Durations,
- Outside temperature, start/stop events





# Water Management

# Water Management

## Drinking water distribution networks

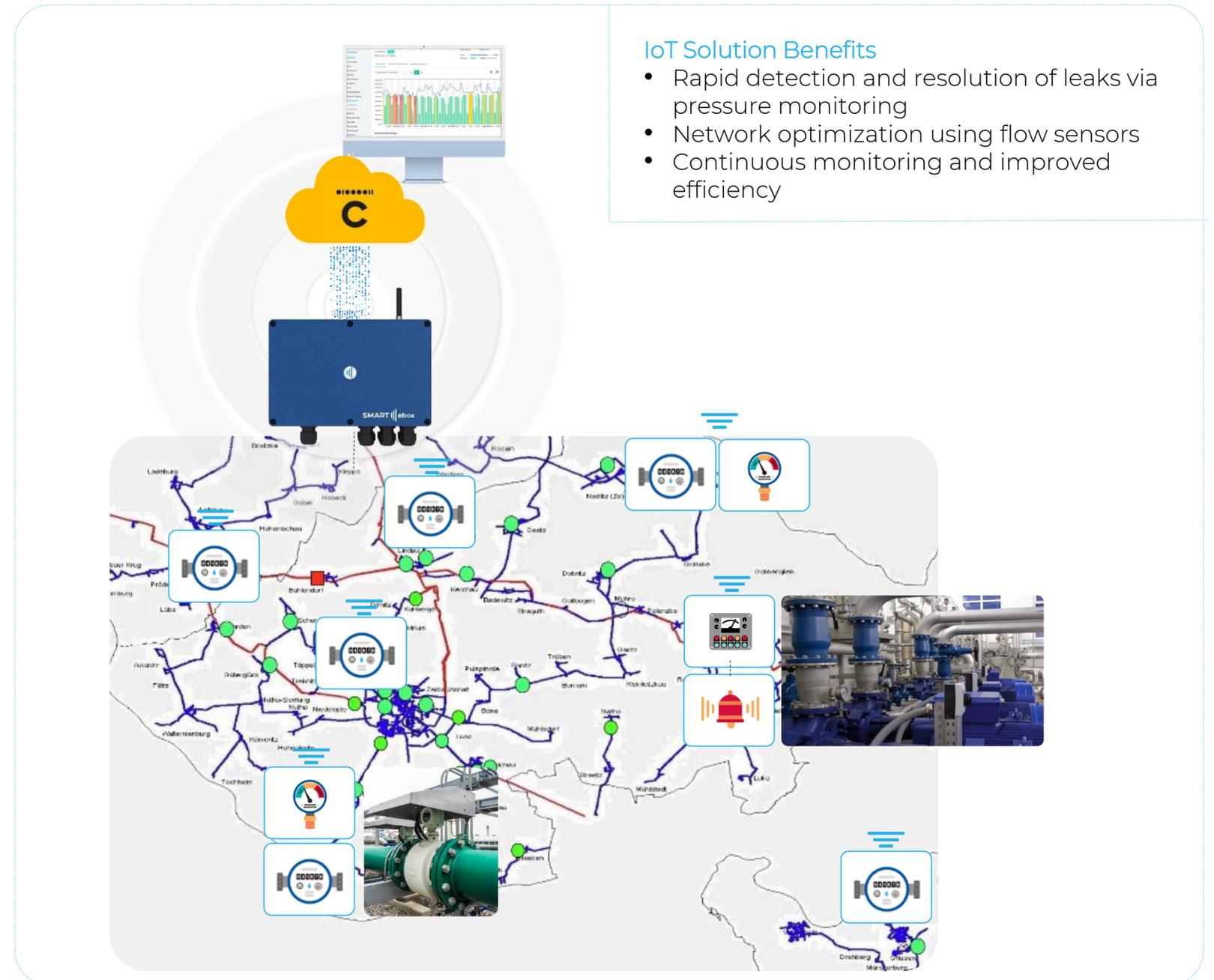


### Application

- An extensive network of pipelines, pumping stations, and water distribution nodes delivers water from the sources to households, businesses, and agricultural areas.
- Drinking water systems require a strong focus on flow rates, pressure stability, and minimizing losses

### Technical infrastructure

- Pipeline pressure sensors,
- Flow meters,
- Pump control systems,
- Leakage detectors
- Water distribution stations



# Water Management Drinking Water Treatment Plants

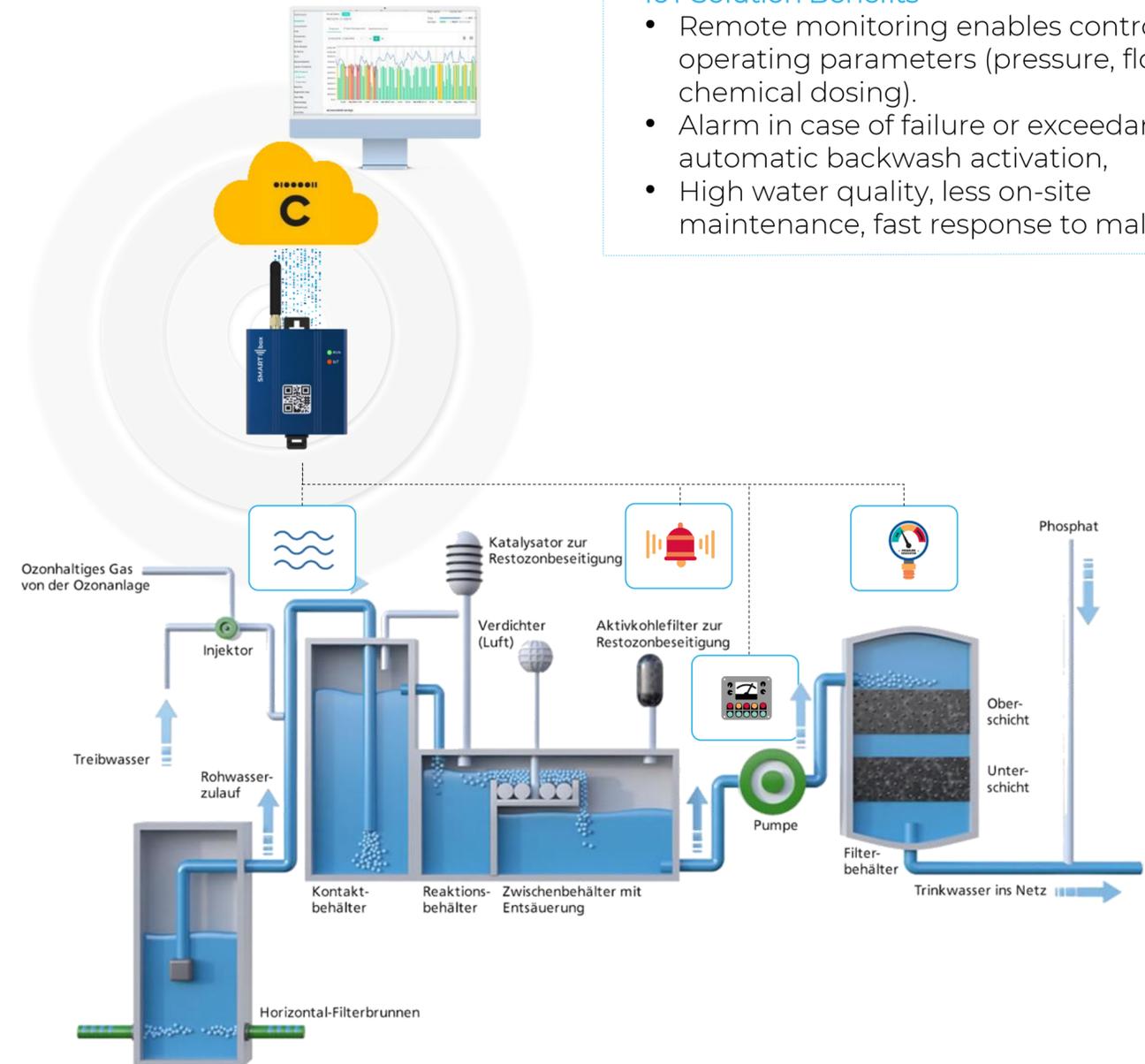


## Application

- In small and medium-sized plants (e.g., village or municipal level,  $\leq 15$  l/s), raw water (wells, surface water) is treated to drinking water quality.
- These plants are crucial for public health and reliable water supply, especially in cities.

## Technical infrastructure

- Filtration system (e.g., sand/disc filter with backwash automation),
- Dosing pumps (chlorine, pH regulation),
- Pressure vessels, valves,
- Compressed air drive for backwashing



## IoT Solution Benefits

- Remote monitoring enables control of operating parameters (pressure, flow, chemical dosing).
- Alarm in case of failure or exceedance, automatic backwash activation,
- High water quality, less on-site maintenance, fast response to malfunctions

# Water Management

## Groundwater wells and pumping systems



### Application

- Especially in rural and dry regions, deep wells are used to extract the often only available groundwater.
- These wells are vital for local water supply and irrigation but are at risk of overuse.

### Technical infrastructure

- Control technology (PLC) for station monitoring
- Level sensors, pump monitoring
- Water quality measurement



# Water Management

## Sewage and stormwater collection networks

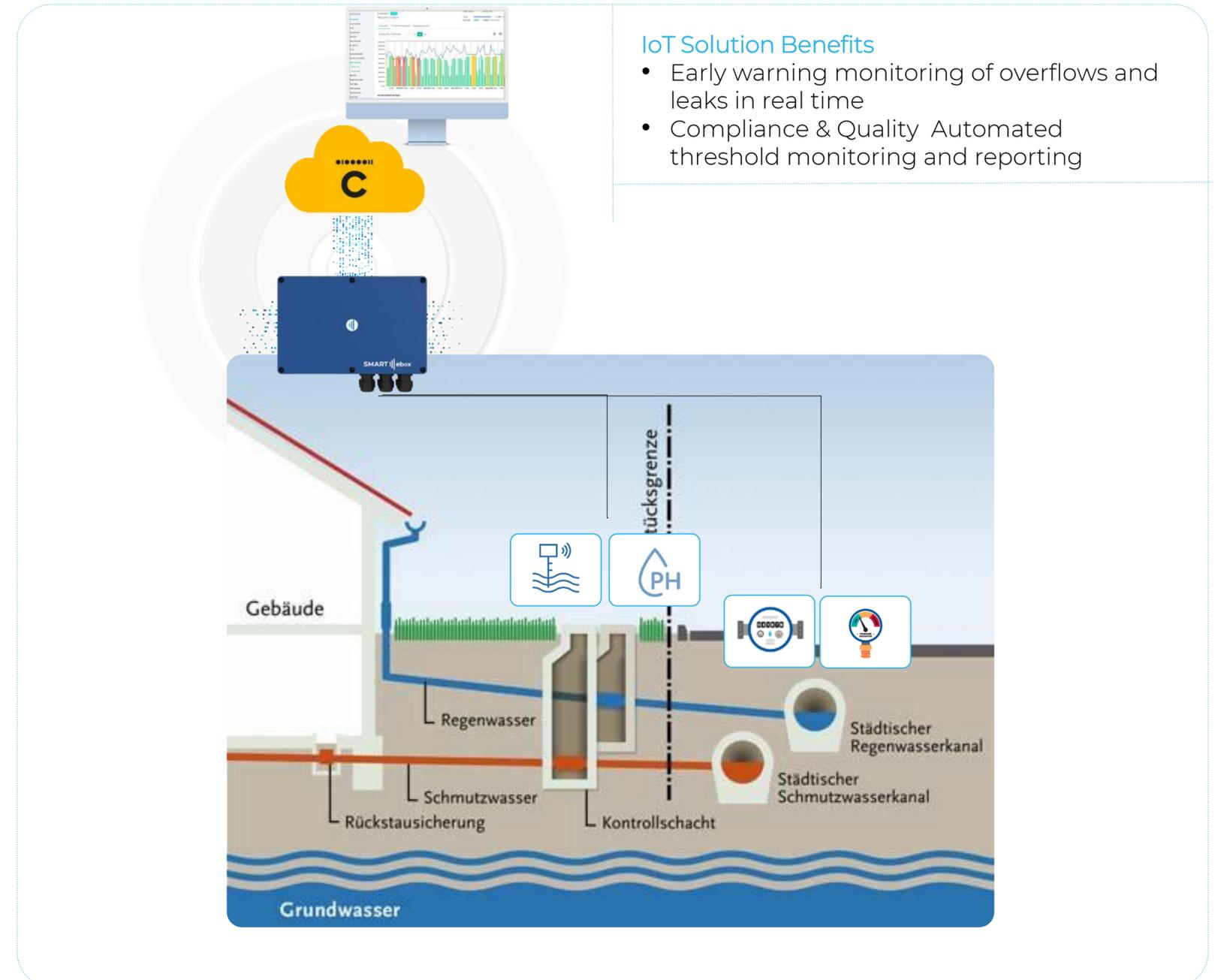


### Application

- For wastewater, the focus is on preventing overflows, operational monitoring, and the SAFETY OF SEWAGE AND STORMWATER COLLECTION NETWORKS

### Technical infrastructure

- Level/height sensors in manholes or storm overflow basins – for overflow warning
- Flow measurement technology (e.g., ultrasonic or magnetic) – for leak or overload monitoring
- Water quality sensors (pH, turbidity, dissolved oxygen) – for chemical monitoring



# Water Management Irrigation

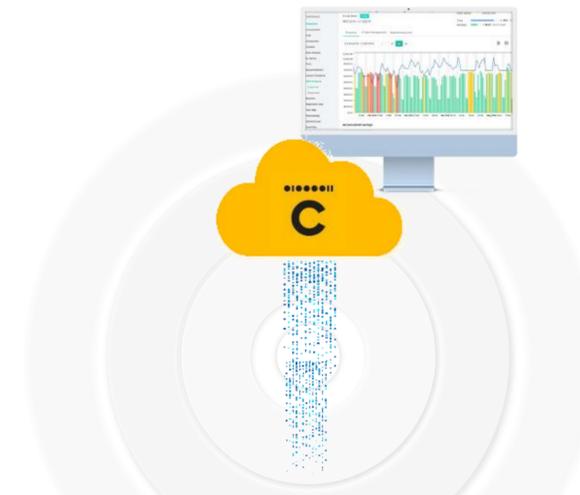


## Application

- Precise adherence to planned irrigation windows (e.g., between 8–10 PM) to increase irrigation efficiency and reduce water loss due to evaporation.
- Operation: Irrigation via sprinklers, drip irrigation, or sprinklers, controlled by central and seasonal schedules.
- Measurement: Regular monitoring by farmers or measuring devices, increasingly through automated systems with feedback at the start/end of irrigation.

## Technical infrastructure

- Flow meters or water meters – measuring water volumes to control irrigation durations



## IoT Solution Benefits

- Water saving & efficiency Irrigation only when needed and at optimal times of day – significantly less consumption
- Monitoring & transparency Real-time feedback on start/end, quantities, and moisture – directly comparable to the plan
- Automatic documentation Complete recording for internal evaluations or subsidy reporting
- Labor savings No manual monitoring required – fully autonomous via IoT controller





Horst LANGE  
Head of Sales  
T: +49 821 319724-126  
M: +49 172 7272282  
Email: [horst.lange@pssystemec.com](mailto:horst.lange@pssystemec.com)



[www.pssystemec.com](http://www.pssystemec.com)

PSsystemec GmbH // Design & Production SMARTbox  
Alter Postweg 94A // 86159 Augsburg // Phone: +49 821 31972400 // E-Mail: [sales@pssystemec.com](mailto:sales@pssystemec.com)