The future of efficient and sustainable data centers

Agenda

- Data Center Market Trends
- Digitalization
- Smart And Connected Architectures
- Monitoring System
- Smart Algorithms
- Digital Ecosystem
- Q&A

Trends

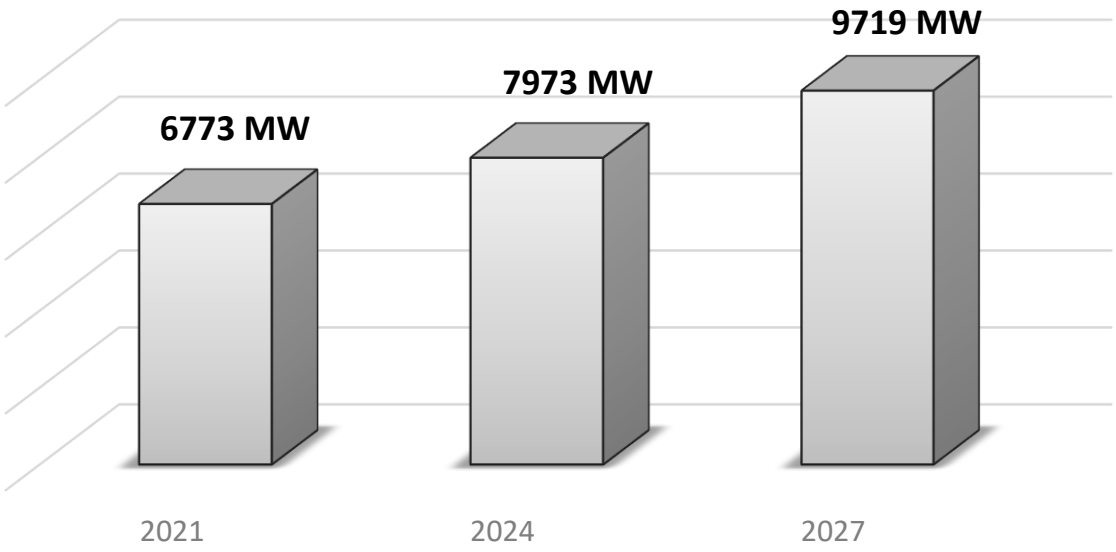
Technologies which are changing the world we know

Cloud computing, big data, internet of things (IoT), artificial intelligence (AI), industry 4.0 are phenomenon which are changing the world we are living in

Data Center Market Growth

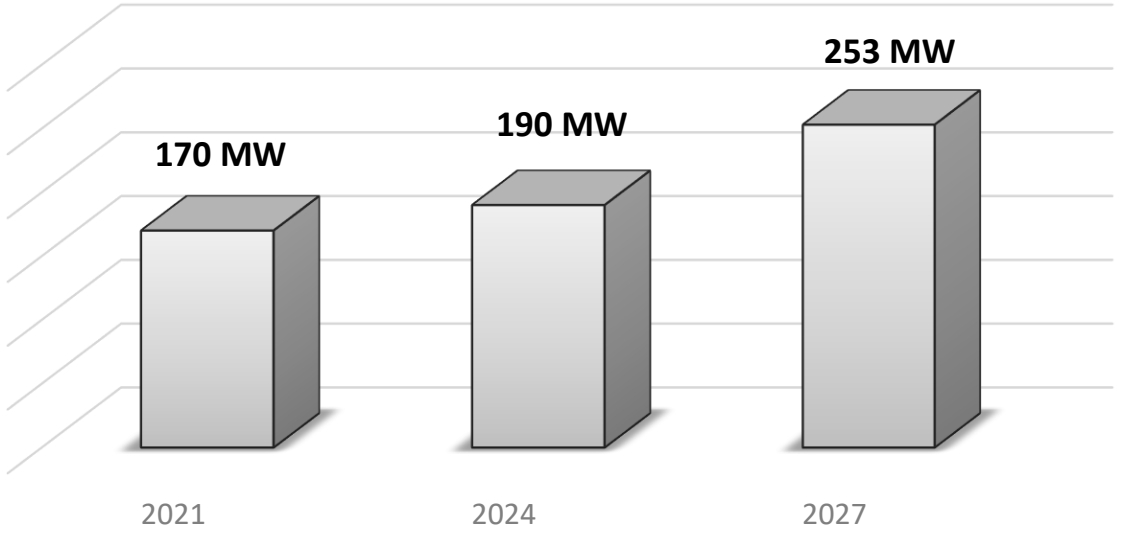
Netherlands Market

Global Market Power Capacity Trend



CAGR
2021-2027
6.20%

Netherland Market Power Capacity Trend



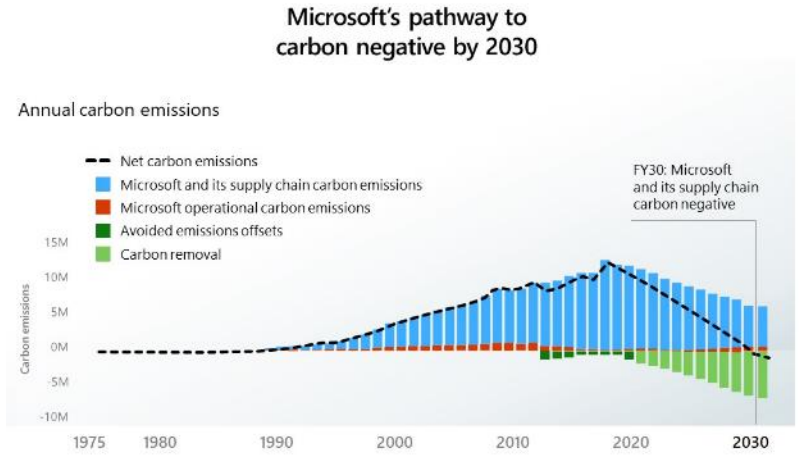
CAGR
2021-2027
6.85%

Source: Arizton

Key Requirements
Sustainable, Efficient and Reliable

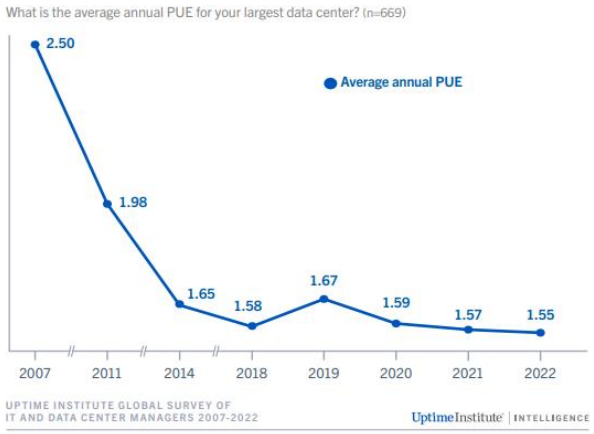
Sustainability

- Sustainability targets set by hyperscale data centers
- New technologies and investments
- Alternative sources of energy



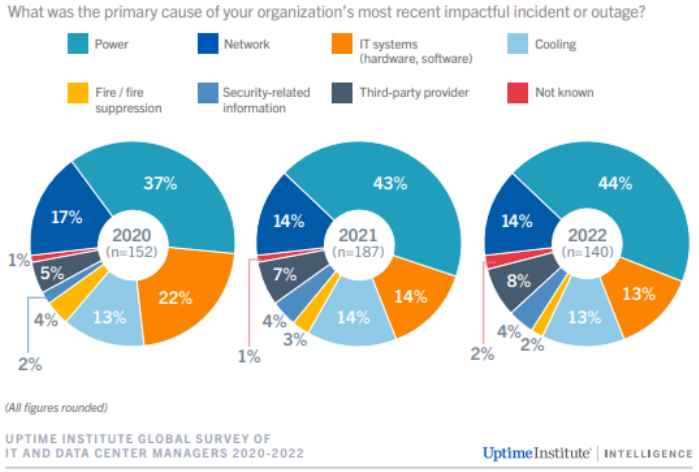
Energy efficiency

- Actions are already taken by data centers to improve energy efficiency
- Further actions are needed to improve energy efficiency



Uptime and Reliability

- Still main priority for data centers
- Maximize reliability with minimum investment
- Use of new technologies



ADB IT INFRA
16 november 2023 | 's-Hertogenbosch
WWW.EHI.NL/ITINFRA

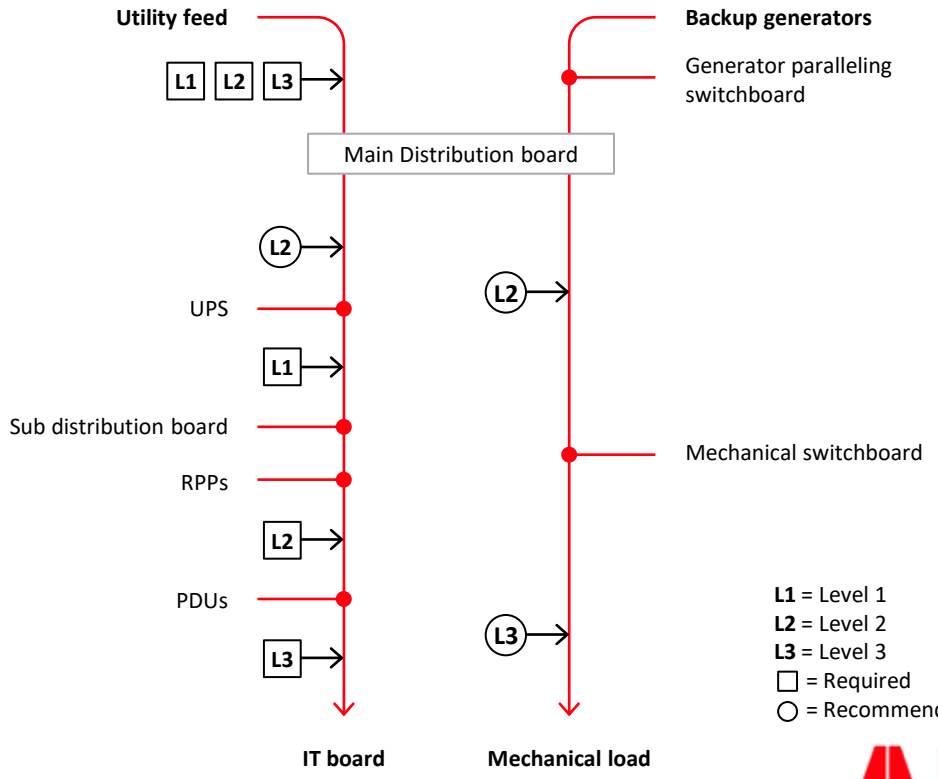
Energy Efficiency

Metrics

Three levels of the PUE measurement

Measurement		Total facility energy	IT equipment energy	Measurement interval
Level 1 (L1) Basic	Required	Utility input	UPS output	Monthly
	Recommended	Utility input	UPS output	Weekly
Level 2 (L2) Intermediate	Required	Utility input	PDU outputs	Daily
	Recommended	Utility input UPS input / output Mechanical inputs	PDU outputs	Hourly
Level 3 (L3) Advanced	Required	Utility input	IT equipment input	15 minutes
	Recommended	PDU outputs	input	15 minutes or less

Placement of the measurement equipment



Source: PUE: A Comprehensive Examination of the Metric by ASHRAE and The Green Grid

Energy Efficiency

Standards

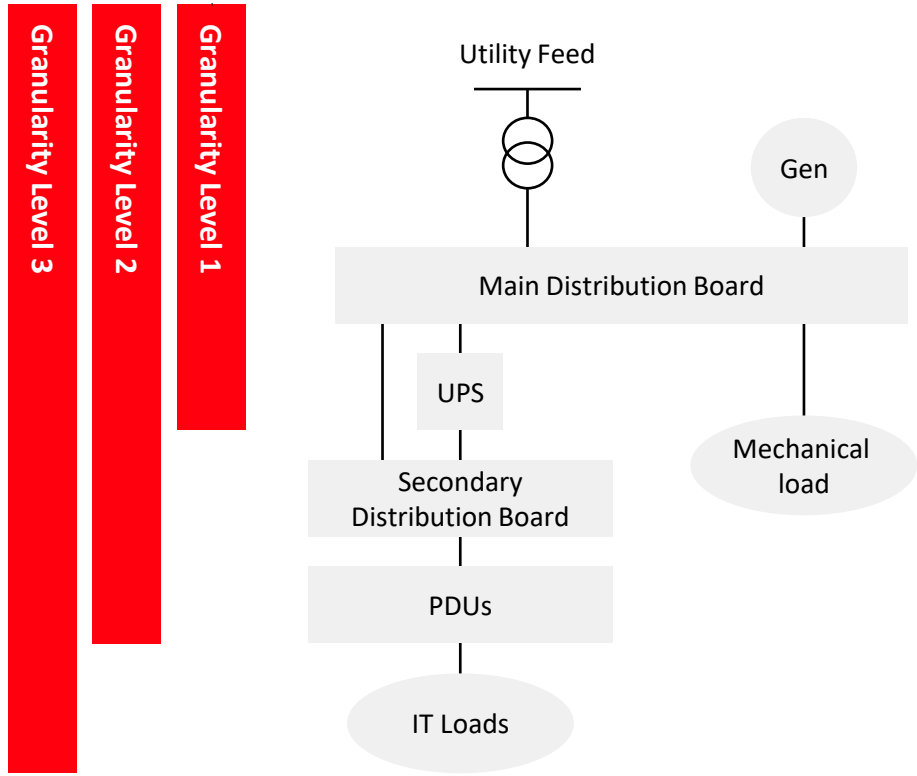
EN 50600-2-2

Required:

Measurement of V, I, PF, E, P with class 1 accuracy.

Recommended:

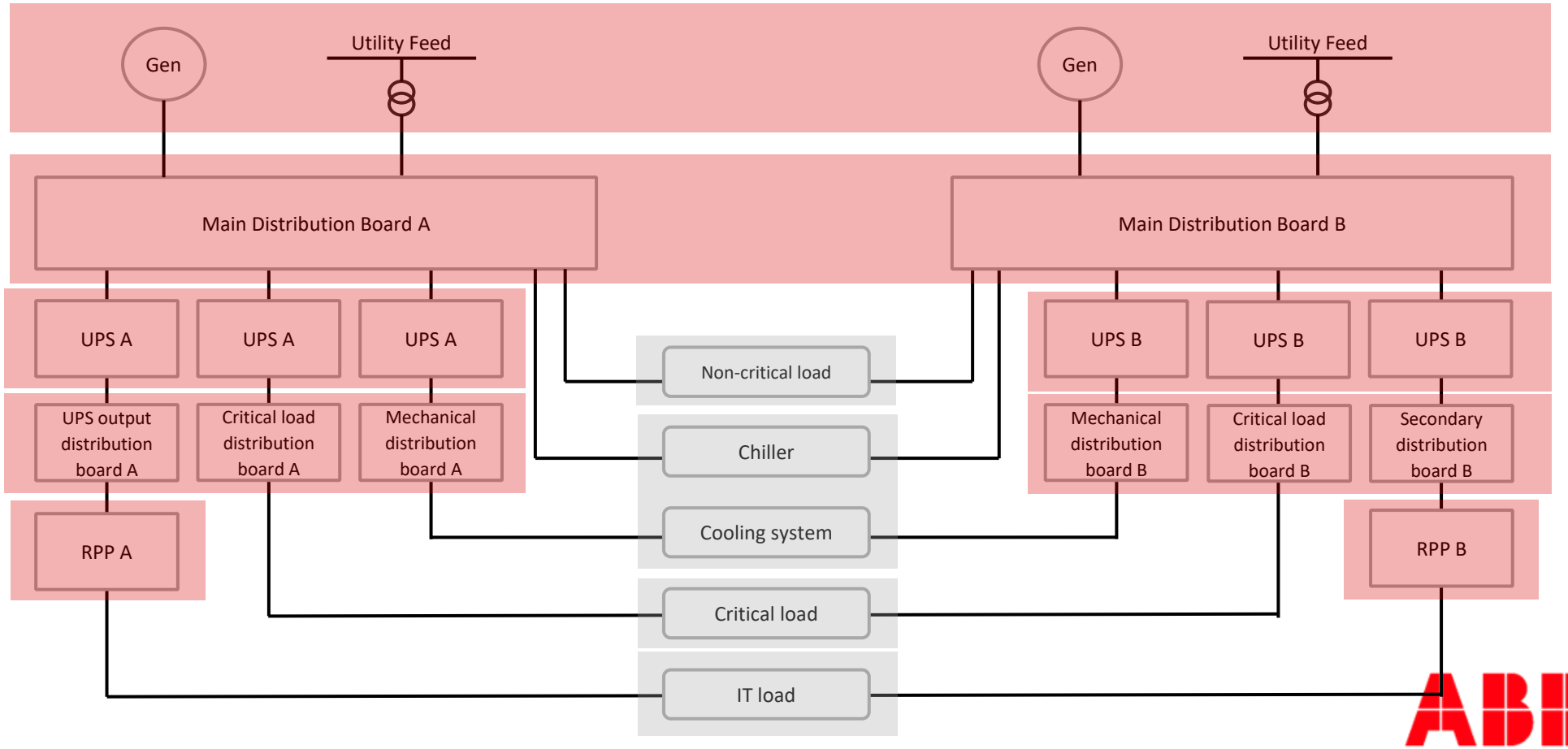
Measurement of Total Harmonic Current Distortion (THCD) and Total Harmonic Voltage Distortion (THVD).



Smart protection devices

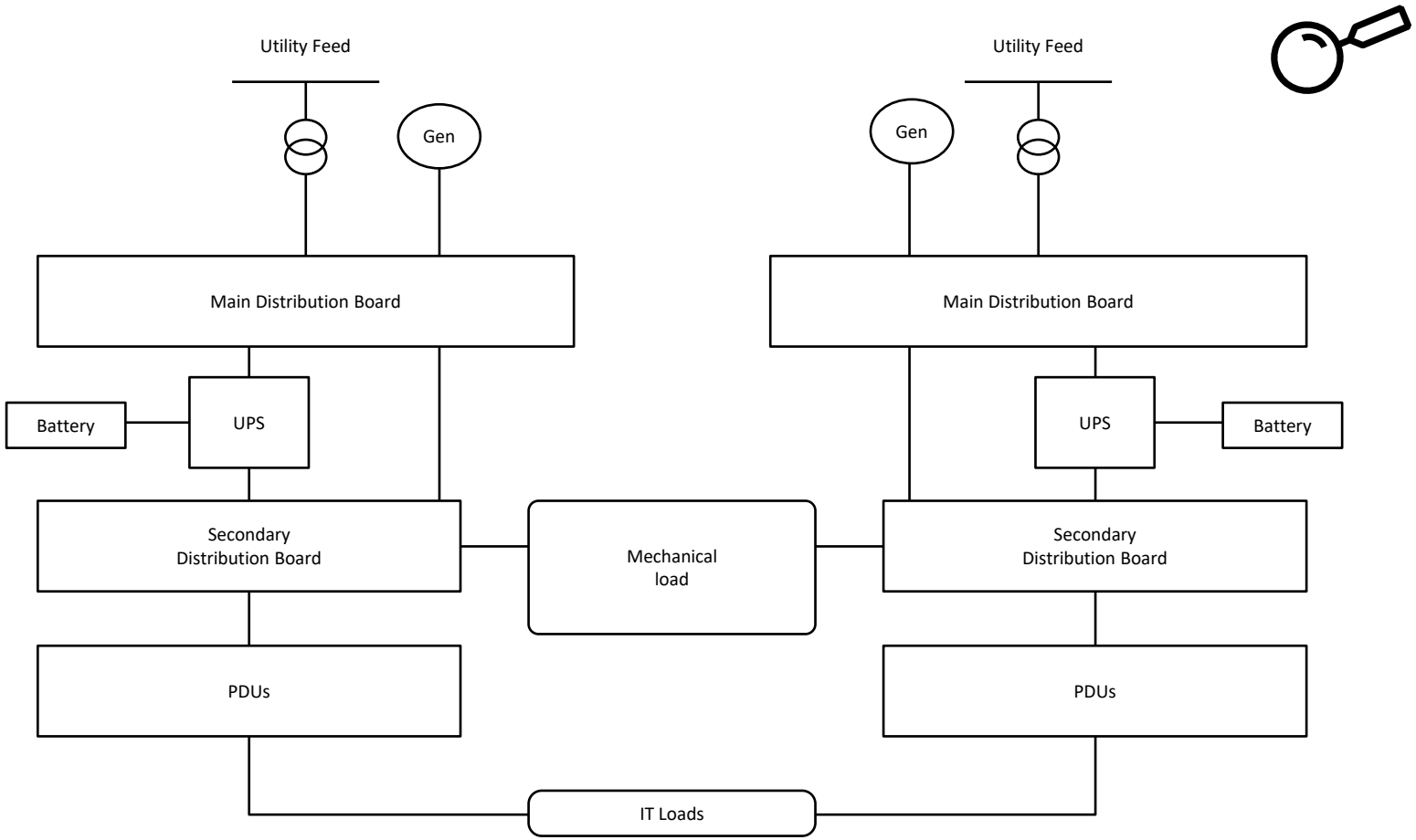
True enablers for Sustainable, Efficient and Reliable Data Centers

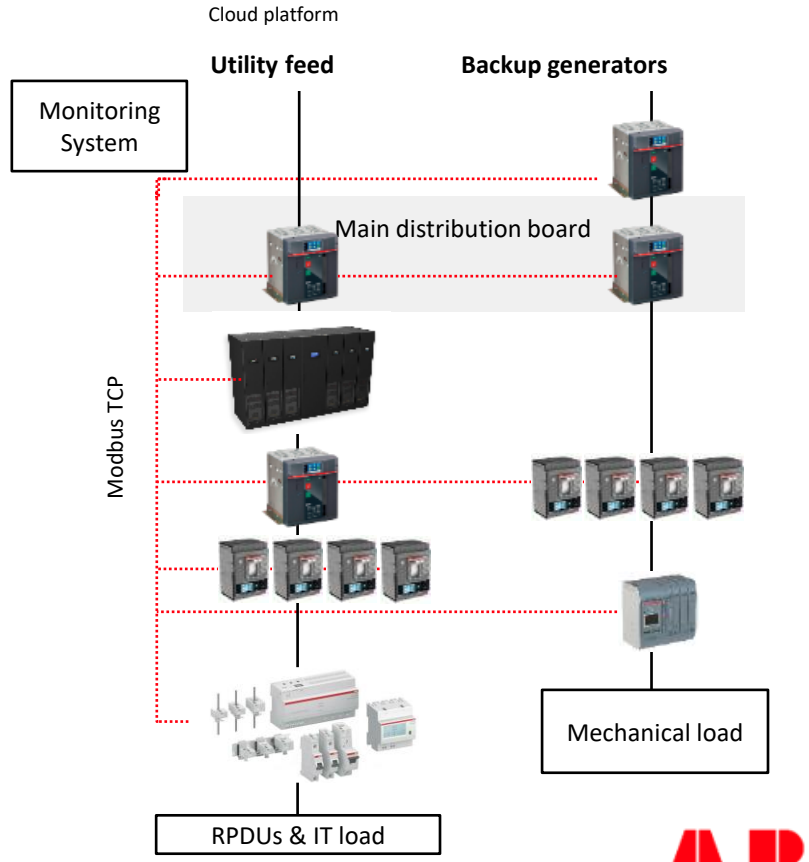
Non-critical loads
Service, non emergency
lightning, offices, sockets,…



Smart protection devices

True enablers for Sustainable, Efficient and Reliable Data Centers



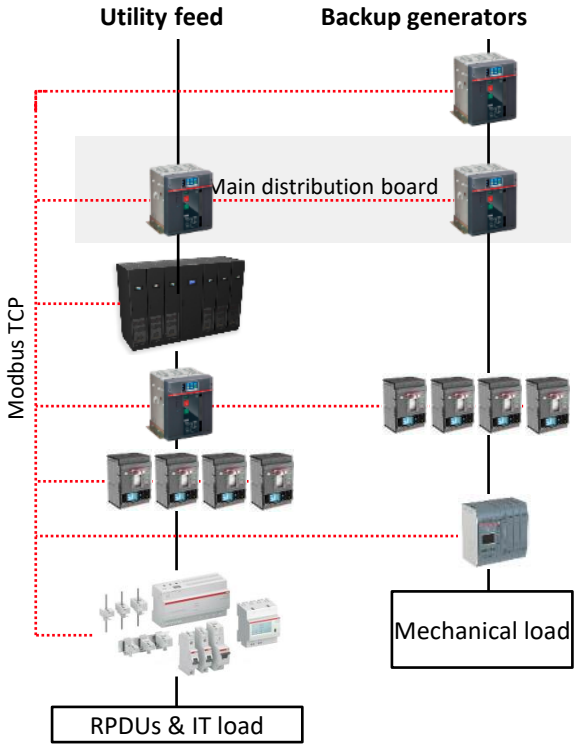


From smart and connected products to monitoring solutions

Key enabler of new technologies for the intelligent data center infrastructures

Smart components

Smart and connected architectures

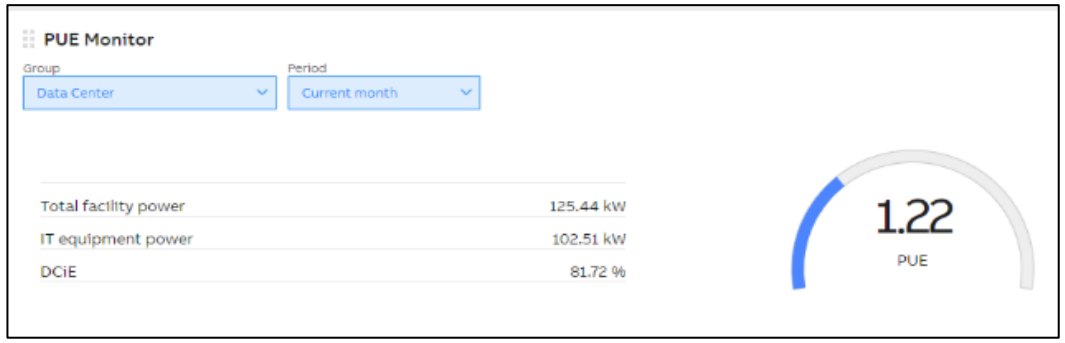


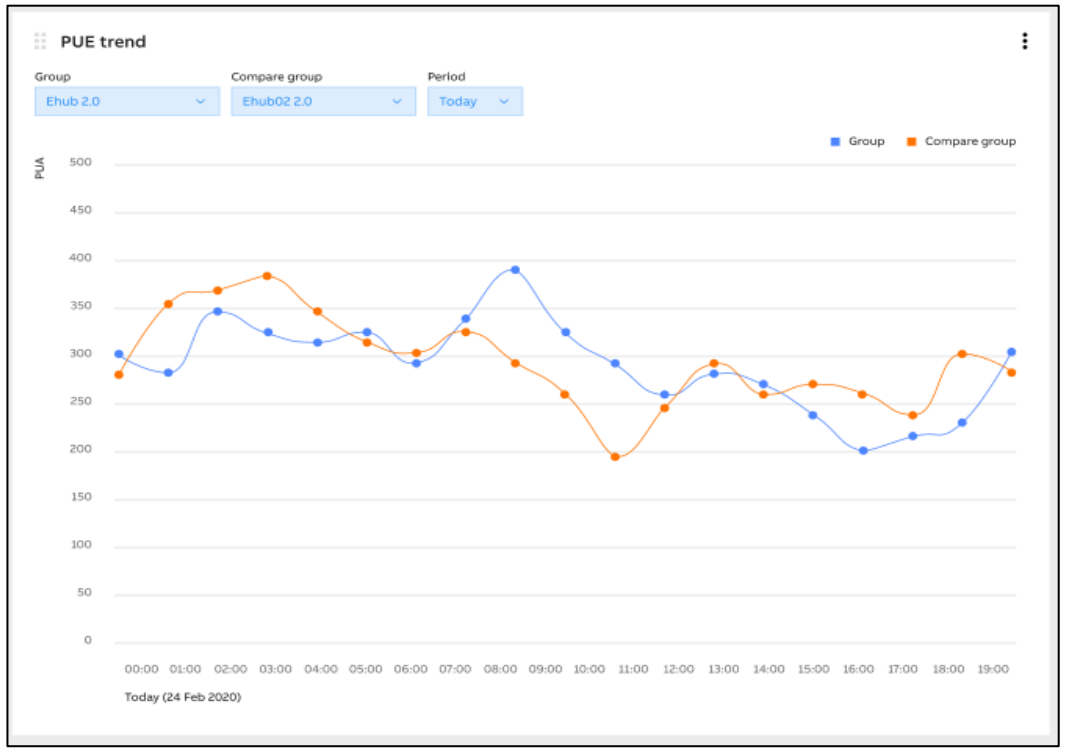
Monitoring and analyzing

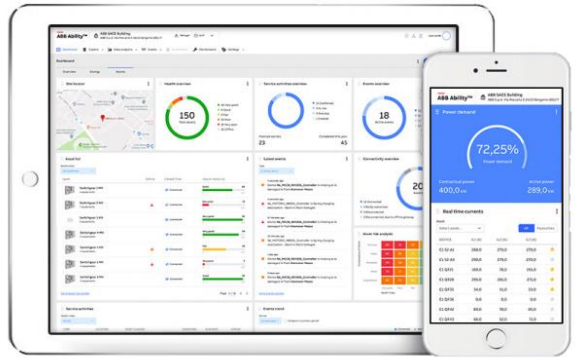
ABB IT INFRA
16 november 2023 | 's-Hertogenbosch

Monitoring system

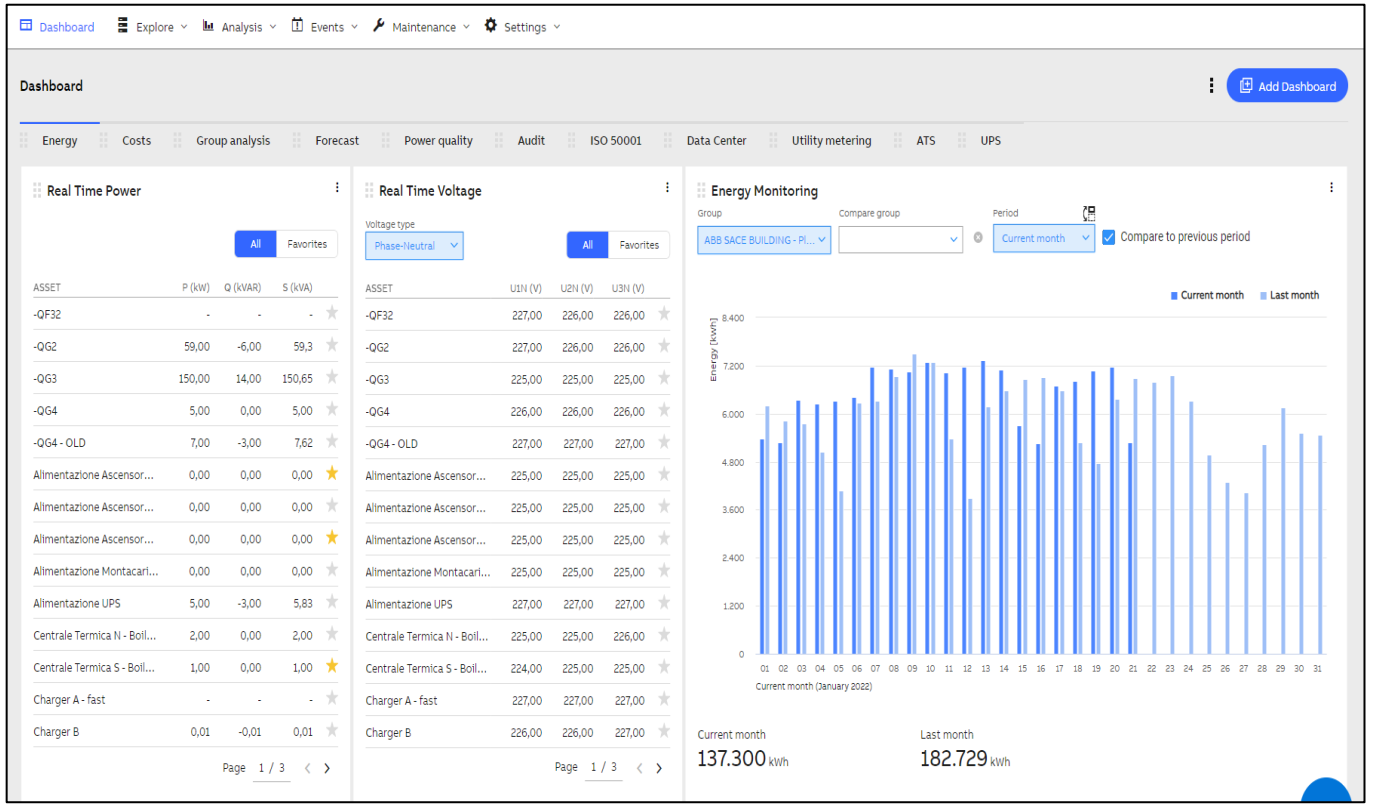
Local monitoring & Cloud platform







Make Better Decisions

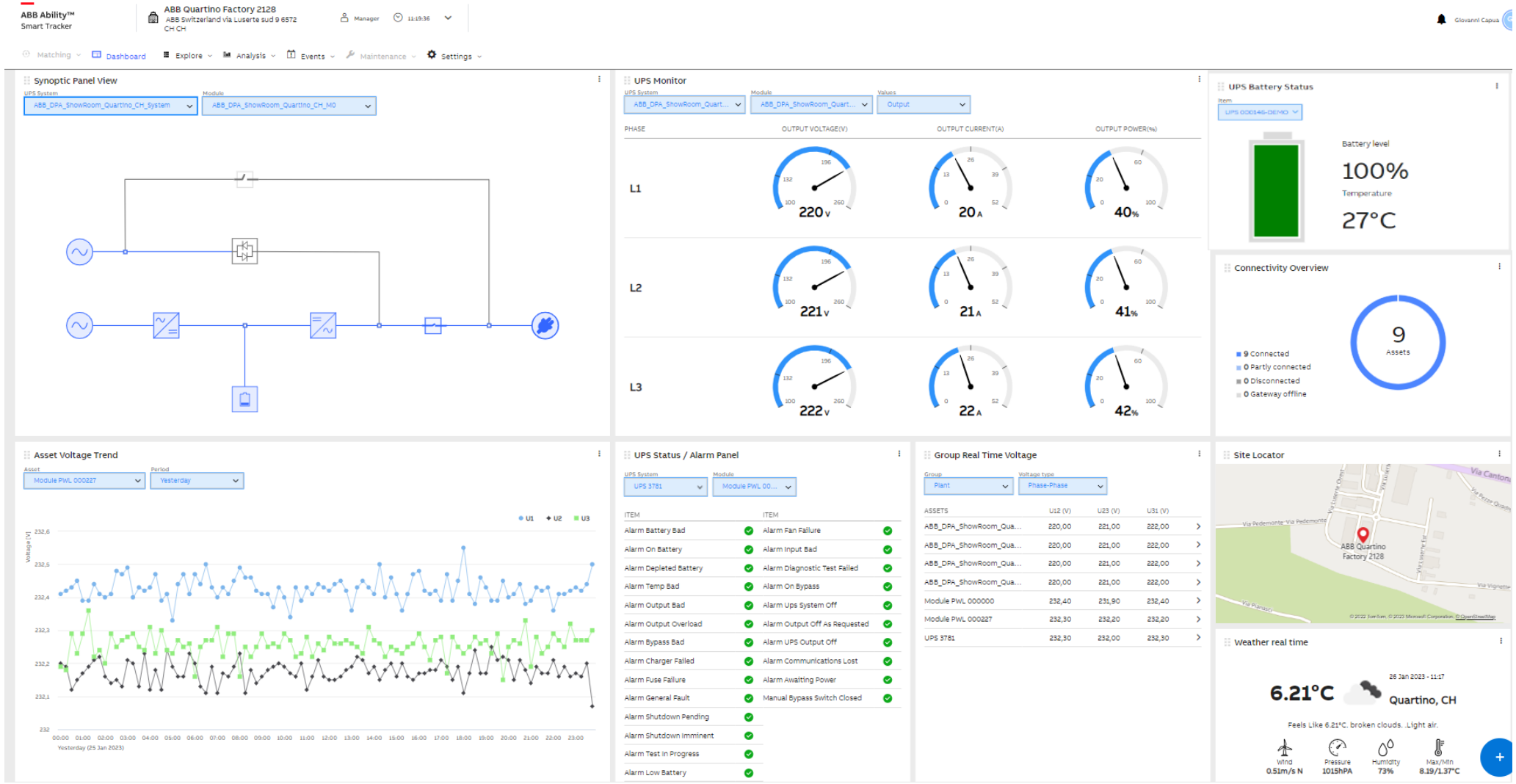


Monitoring real time data

Analyze trends & historical data

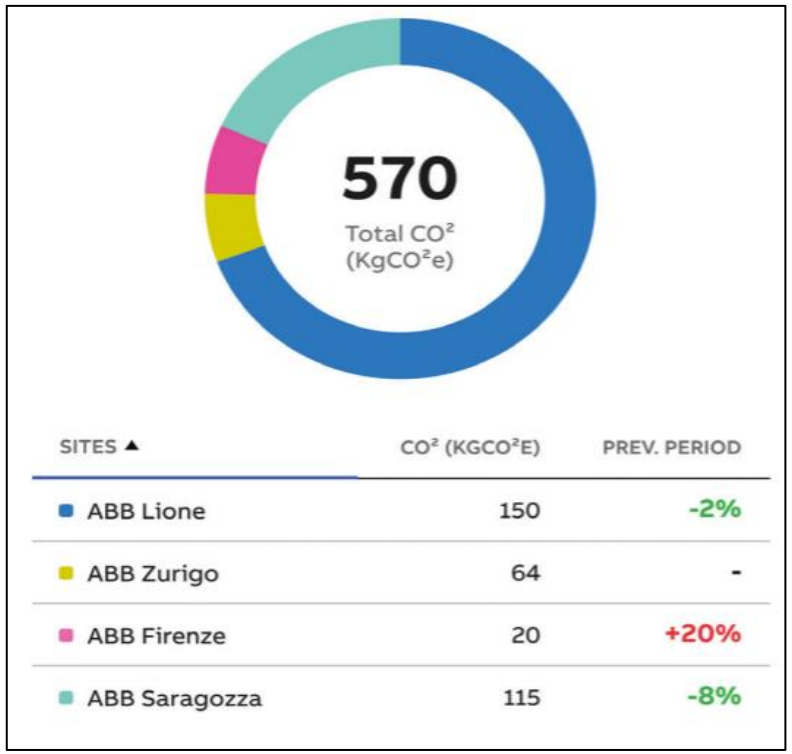
Monitoring system

Local monitoring & Cloud platform

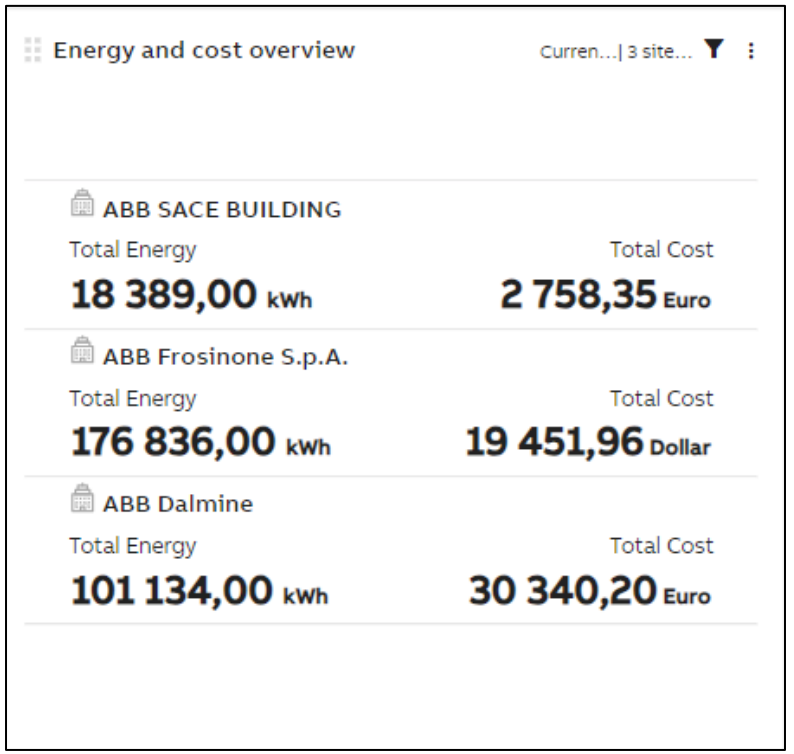


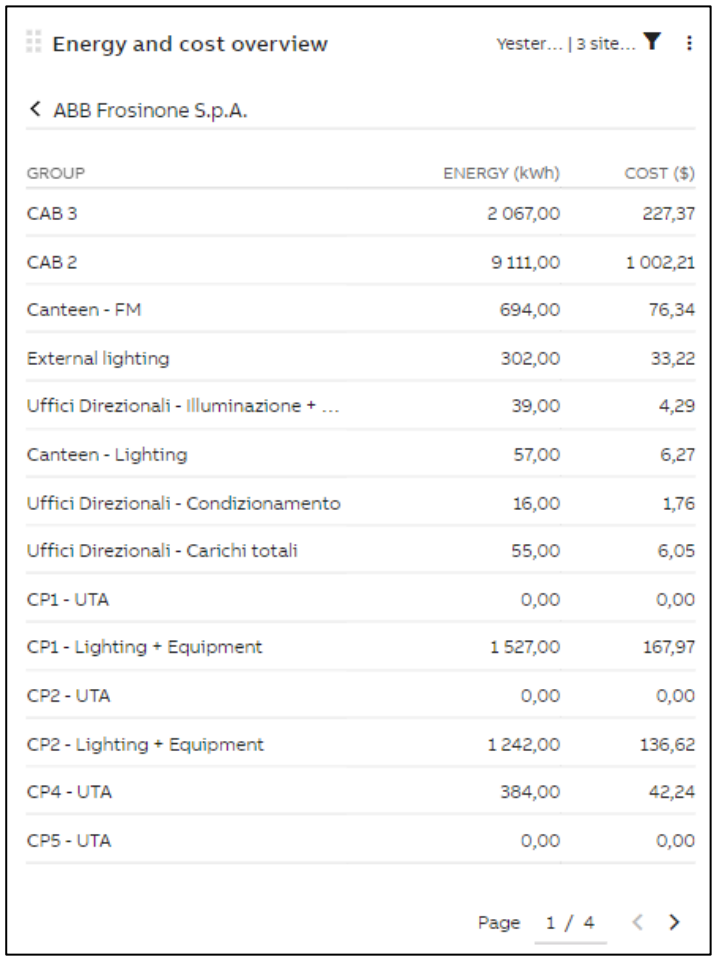
Monitoring system

Local monitoring & Cloud platform



With a location-based emission factor parameters, we can have Insights on different sites CO_2 emission





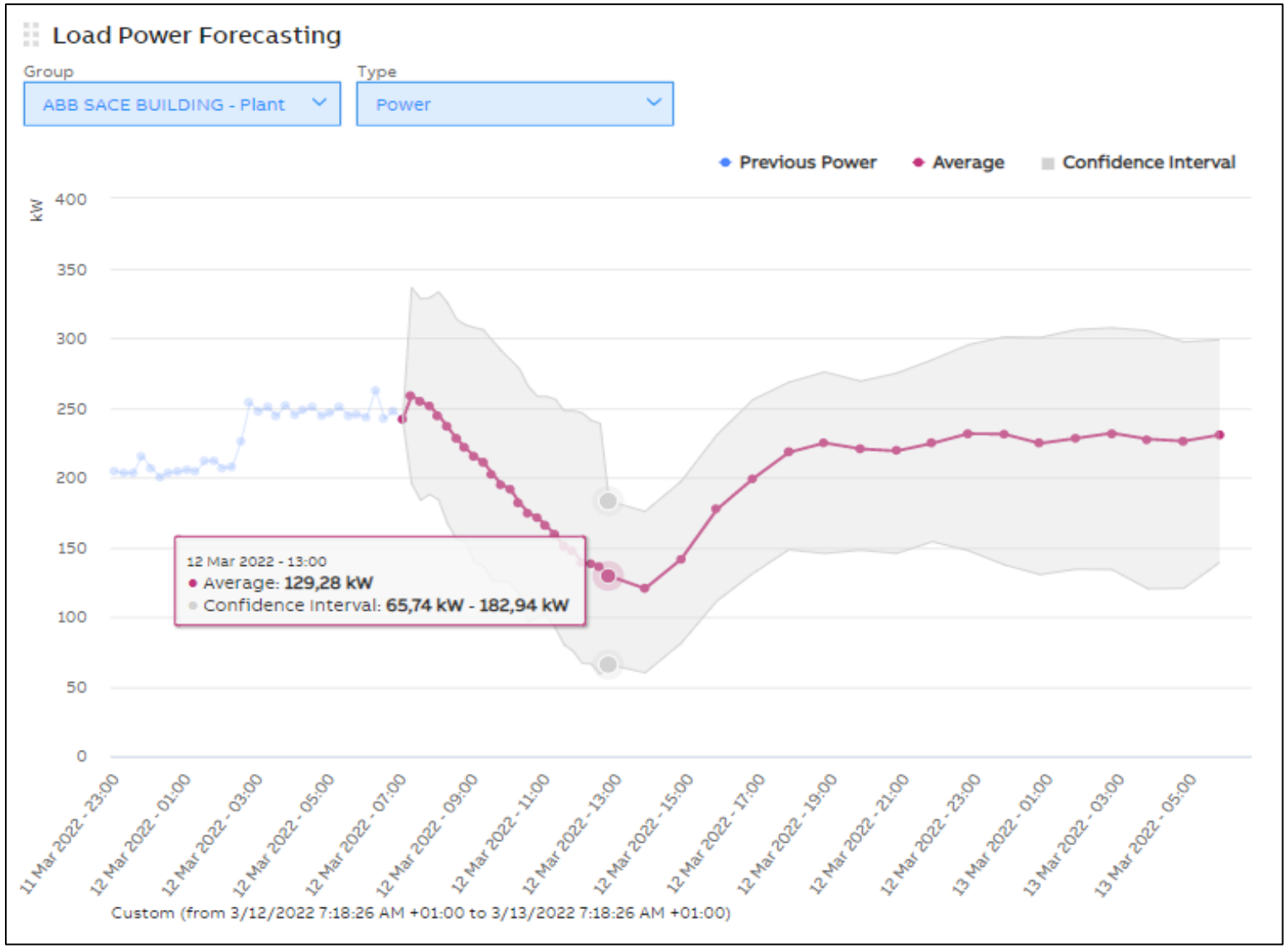
Energy and cost overview widget for specific sites or groups over selected a period of time

Monitoring system

Smart Algorithms

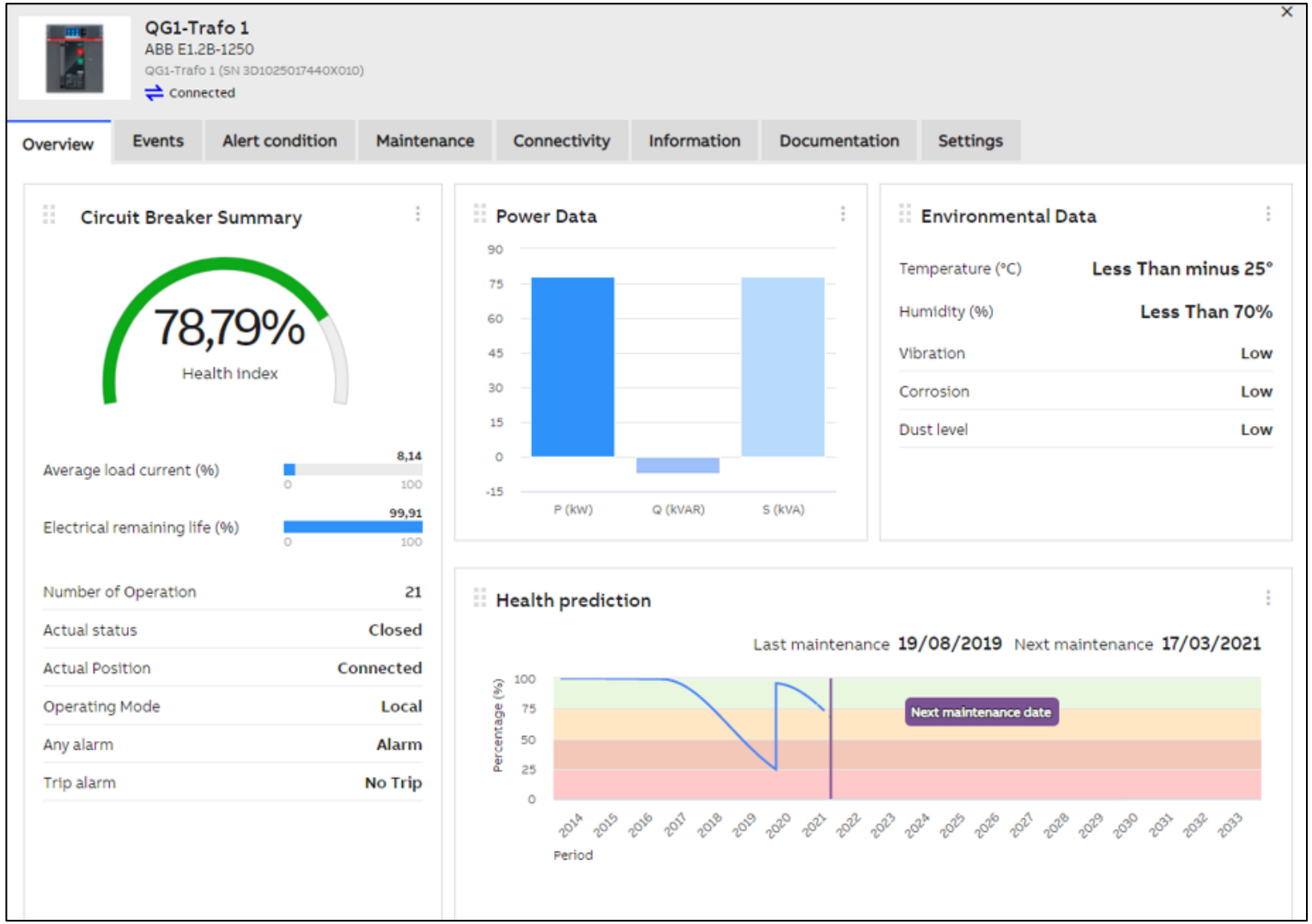
Load Power Forecasting

Load Power Forecasting algorithm learns from previous consumption and forecasts future power consumption. Thus anticipating high energy demand events, so end users (facilities managers) can take corrective actions to reduce energy consumption and optimize costs.



Monitoring system

Smart Algorithms



Predictive Maintenance

Predictive Maintenance is a sophisticated algorithm that leverages real time inputs and an analysis of the product's health conditions that considers:

1. Age.
2. Installation date.
3. Environmental conditions.
4. Utilization conditions.
5. Maintenance activities.

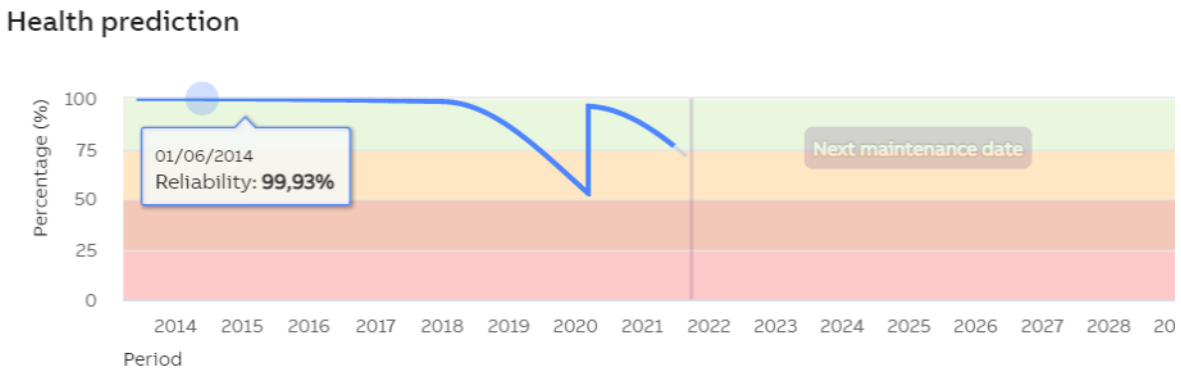
Monitoring system

Smart Algorithms

Predictive Maintenance

Provides the following actionable details concerning the device's health

- Devices aging profile
- The next recommended maintenance date
- Refreshes devices' profile based on actual maintenance performed



Green - Good: low risk of fault; Yellow - Medium: medium-low risk of fault;

Orange - Moderate: medium-high risk of fault; Red - Critical: high risk of fault

Added Value

Moving from preventive to Predictive Maintenance, customers can reduce

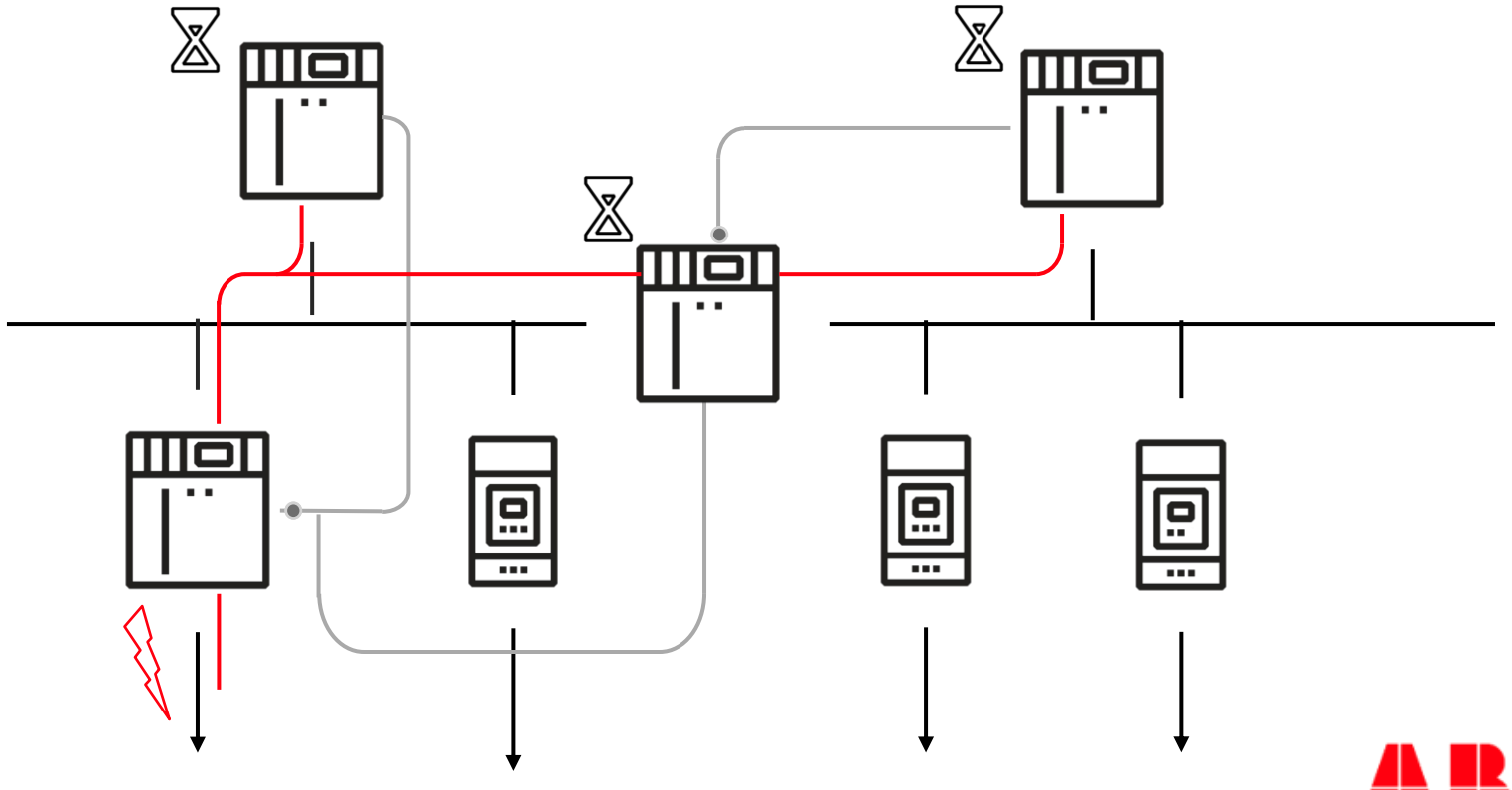
- Maintenance frequency
- Related costs
- Extend the life of electrical systems

And with **36%** less maintenance cost

Continuous Power in Main Distribution Board

Zone Selectivity Interlock (ZSI) with Ethernet

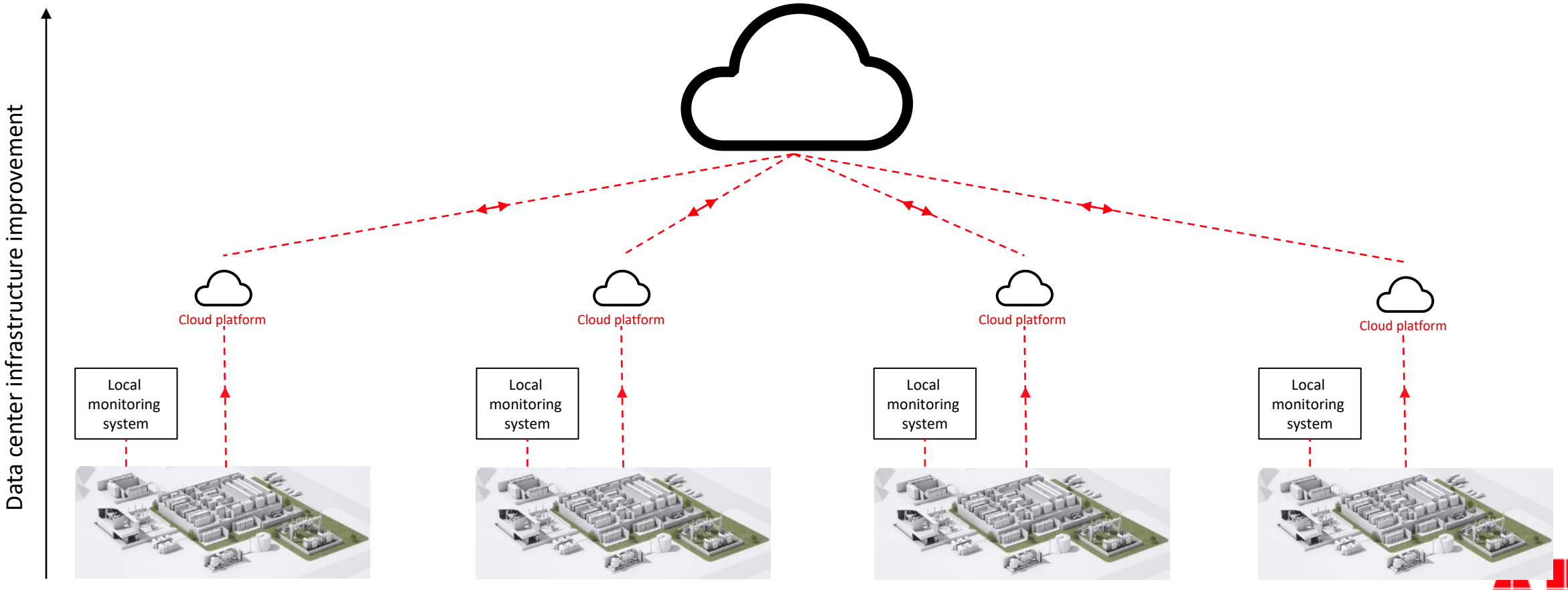
- Only the Ethernet cable is required*
- Up to 3 different clients
- 1 module for both supervision & ZSI
- Faster Communication
- IEC61850 for LV-MV coordination



*with ethernet switch

Digital Ecosystem

Interconnected data centers



As a technology leader in the field of data centers, ABB provides reliable, sustainable and efficient solutions and leading the way to a low-carbon future through innovation.

ABB

IT INFRA

16 november 2023 | 's-Hertogenbosch

WWW.EHI.NL/ITINFRA

Q&A


ABB
IT INFRA
16 november 2023 | 's-Hertogenbosch
WWW.EHI.NL/ITINFRA

Contact details

- Company: 
- Address: George Hintzenweg 81, Rotterdam
- Phone number: +31104078972
  Mobile number: +31653474500
- E-mail: freek.alphen@nl.abb.com
  Omar.ibrahim@it.abb.com
- Stand number: 12