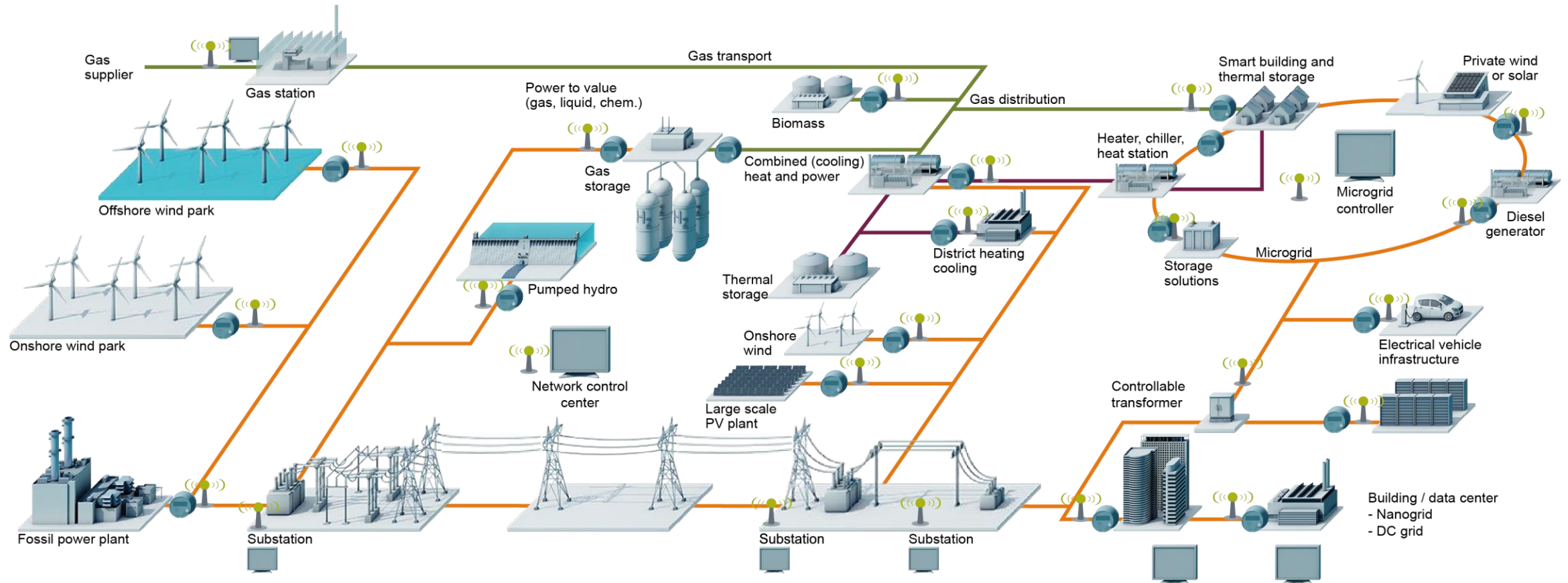


Grid Connected

Connecting an all-electric world Strategies for 3D grids in the IoT age

Thomas Zimmermann | CEO Siemens Digital Grid

Growing share of renewables and distributed generation calls for end-to-end energy management



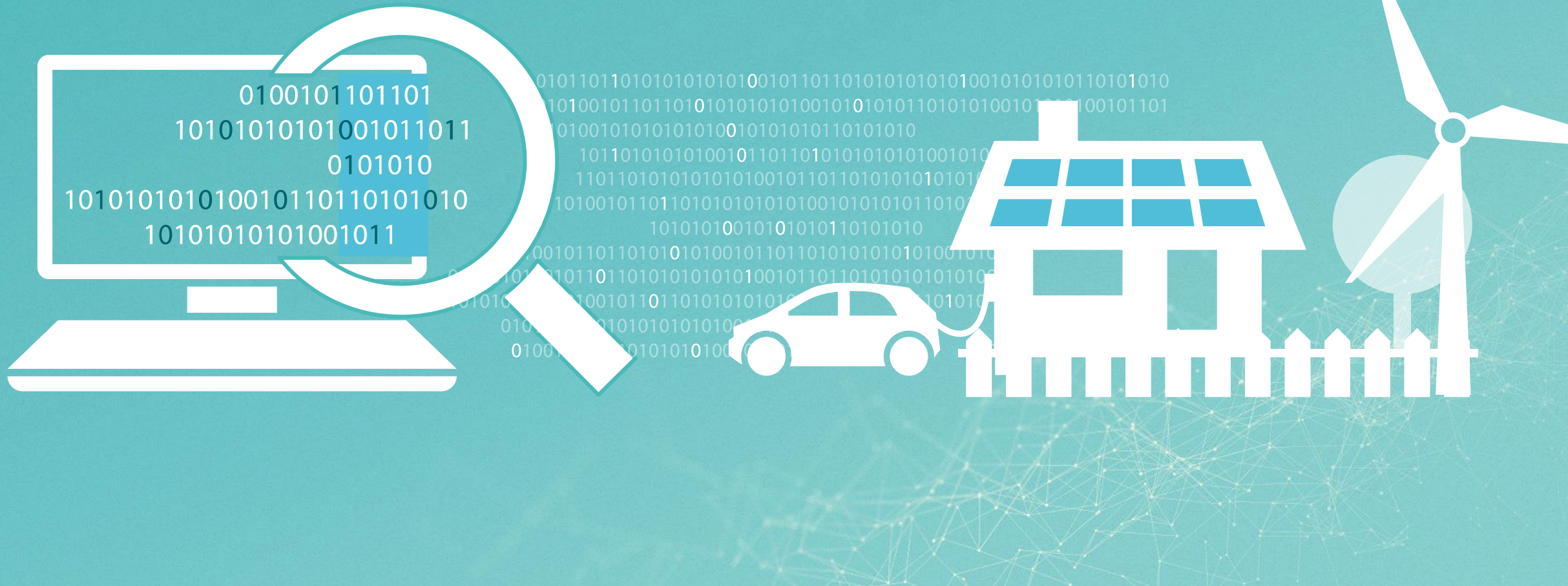
More electrification

- Further development of electrification levels in emerging economies
- Grid modernization required in many regions

Distributed generation

- Increasing level of renewable and distributed generation
- Grid stability challenges

“ Connecting an all-electric world Sustainable | Intelligent | Secure ”



Driving the next level of an connected all-electric world for sustainable, intelligent and secure power



Productivity and time-to-market

Planning, simulation &
engineering

Flexibility and resilience

Automation & control

Availability and efficiency

Maintenance,
monitoring & service

Use cases, applications



Digital twin



Grid simulation



Grid planning



Grid control



Grid
diagnostics



Asset
management



Digital
substation



Virtual power
plant



Smart
metering



Monitoring
DER¹⁾



Energy efficiency
and analytics



Connected power assets and ...



... connected edge devices



Generation

Transmission / Distribution & Smart Grid

Consumption / Prosumption

1) DER: Distributed energy resources like smart meters, inverters for photovoltaics, e-mobility assets, storage systems, microgrids, ...

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Key areas to step up

Internet of Energy

Electrical Digital Twin

Substations with the future
built in

Local rebalancing

Intelligent grids

Secure metering operations

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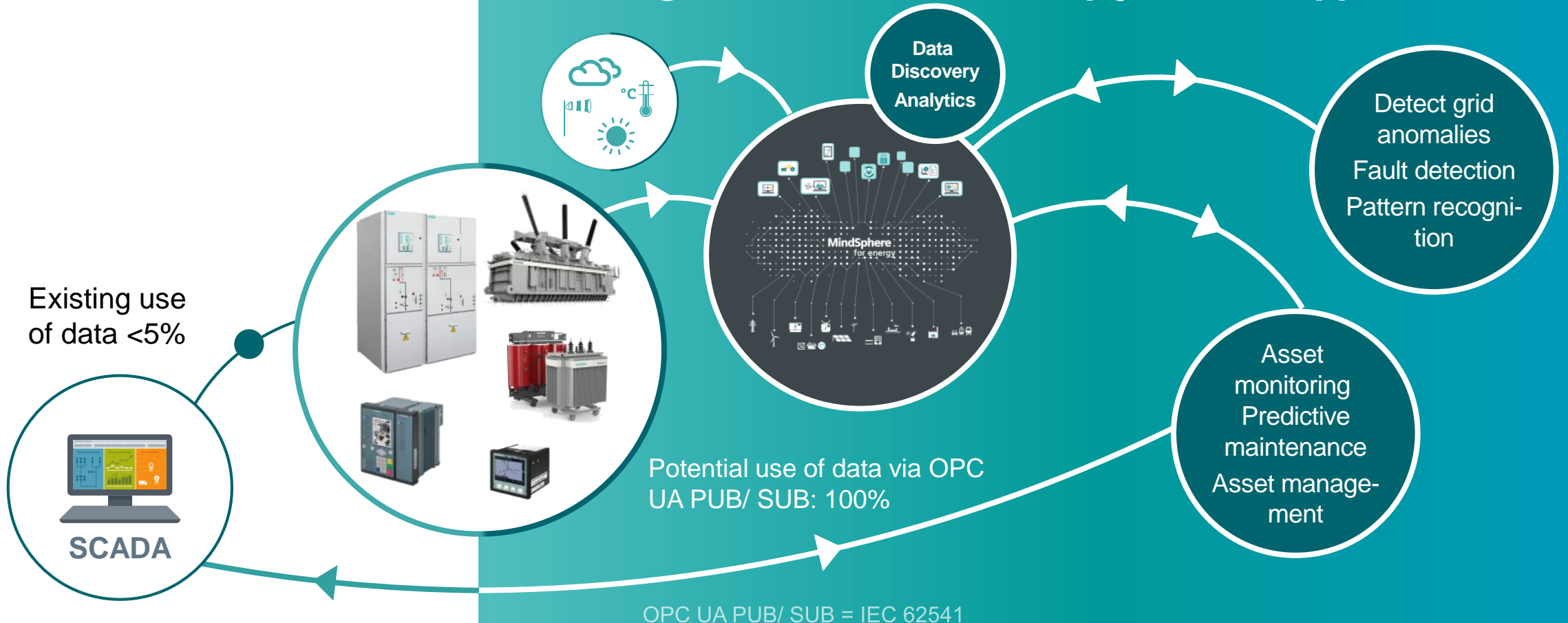
Local rebalancing

Intelligent grids

Secure metering

“New” data available through IoT connectivity

Monitor e.g. health status of your substation assets with Grid Diagnostics Suite or develop your own apps



IoE – Powered by MindSphere

Grid Diagnostic Suite - Increase grid availability and service quality for power grids



Our building blocks

1. **SIPROTEC Dashboard**
analyze grid status & optimize maintenance
2. **SICAM PQ Advisor**
detect and analyze grid quality & anomalies
3. **SICAM SA Supervisor**
ensure fast fault location & reduce outage duration

Our USPs

- Use of huge installed base for future IoT applications and digital services
- Easy, open, and secure connectivity to MindSphere / IoT platforms
- International industry standard (IEC 62541/ OPC UA Pub/Sub)
- First mobile applications for grid diagnostics

**Simplifying our customer's journey
along the digital transformation
into the Internet of Energy**



IoE – Powered by MindSphere

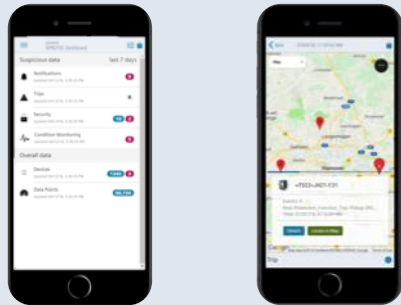
Grid Diagnostic Suite – Increase grid availability and service quality for power grids



Make data transparent to everyone & enable root cause analysis

NEW
Booth
station 1.3

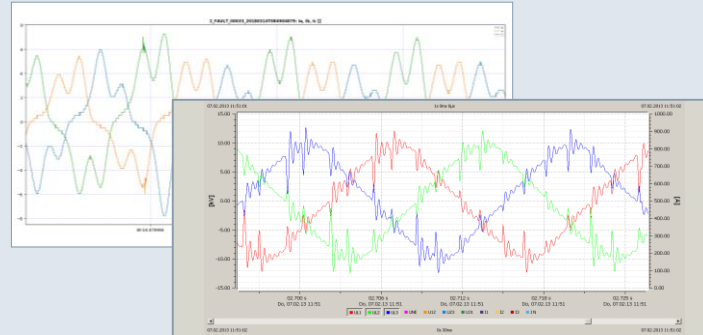
SIPROTEC Dashboard



- Mobile App with notifications running on iOS and Android
- Quick overview about the status of your grid assets
- Risk detection & Condition Monitoring

Standard Applications

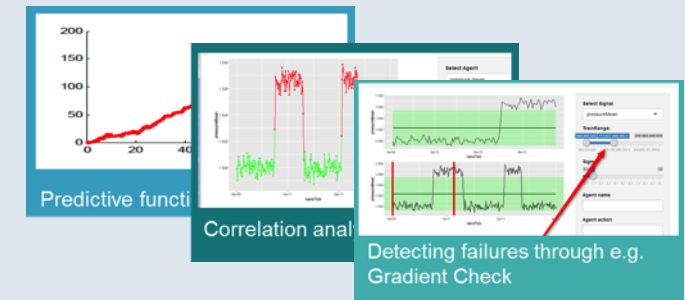
SICAM Power Quality Advisor



- Browser-based App
- Power Quality Evaluation
- Trend Analytics
- Anomaly Detection

Data discovery, analytics & Co-creation

NEW
Booth
station 1.3



- Advanced analytics & problem solving through grid simulations
- Optimize grid availability and utilization of assets
- Cost reduction through predictive maintenance

Customer-tailored Services

IoE – Powered by MindSphere

Distribution Grid Analytics – Managing faults and optimizing resilience



The What

- Improve reliability
- Improve availability
- Reduce OPEX and CAPEX

The How

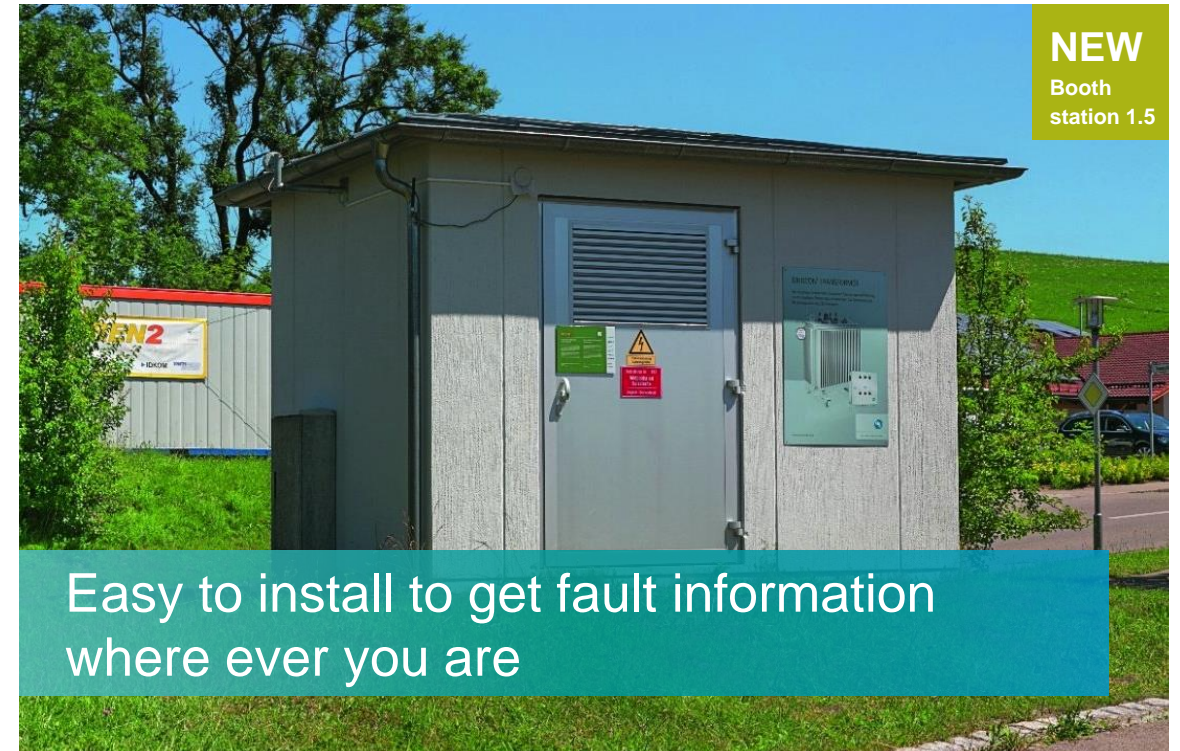
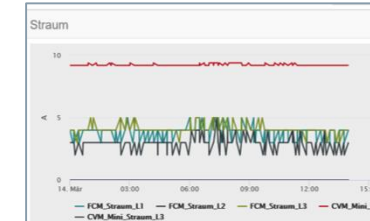
- Quick and efficient fault clearance
- Get notified on overload situations
- Improve KPIs of Outages (SAIDI)

The Feedback

- We have had 3 faults during our trail phase and instead of 3 hours we could solve the problem within 35 minutes
Scottish customer

The Digital Transformation and Innovation

- Reduce down-times by typically 30%
- Analyze grid utilization to reduce cost for grid extensions
- Analyze grid usage to avoid outages



IoE – Powered by MindSphere

EnergyIP Distributed Energy Optimization – Maximizing performance of DER



The What

- Monitoring process data (production, consumption, assets)
- Unifying reporting and analysis, calculating KPIs
- Managing assets to optimize performance

The How

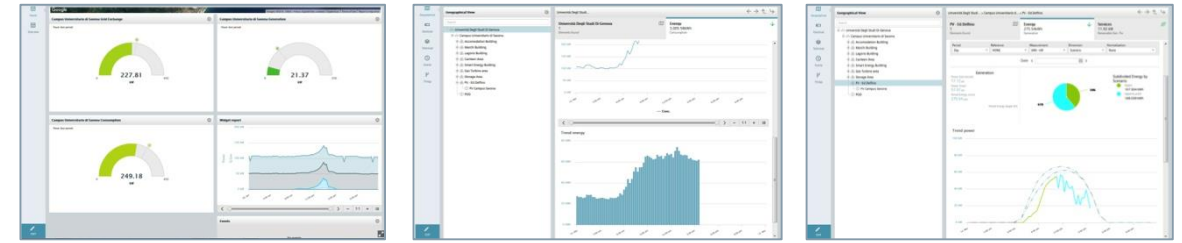
- Co-development of app with customer to improve asset performance
- Simultaneously “lifting and shifting” onto MindSphere cloud

The Feedback

- Easy to use and intuitive
- Fast track deployment
- Open and flexible product

The Digital Transformation and Innovation

- Makes single SCADA systems more or less superfluous
- Consistent unified views improve client’s decision making process drastically
- Enables additional business models (e.g. market participation)



European Utility Week 2018

Siemens Booth Navigator



1.0 IoE – Powered by MindSphere

- 1.1 EnergyIP Analytics (New: Asset Topology Mapping)
- 1.2 EnergyIP Distributed Energy Optimization
- 1.3 Grid Diagnostic Suite and IoE Connectivity
- 1.4 Substation Device Management
- 1.5 Distribution Grid Analytics
- 1.6 MindSphere – Shaping Digitalization Together
- 1.7 MindSphere – Shaping Digitalization Together
- 1.8 OMNECTRIC – Journey to the T in IoT
- 1.9 OMNECTRIC – IT/OT Integration
- 1.10 OMNECTRIC – IoE – Powered by MindSphere

2.0 Substations with future built-in

- 2.1 Process bus solution with SIPROTEC 5
- 2.2 SIPROTEC 5 Merging Unit
- 2.3 SICAM A8000
- 2.4 DA-Box
- 2.5 RUGGEDCOM

3.0 Local rebalancing

- 3.1 Self Optimizing Grid (SOG)
- 3.2 EnergyIP DEMS Demand Response and VPP
- 3.3 Distributed Energy Systems (DES)
- 3.4 Energy Configurator
- 3.5 Energy storage solutions (Fluence)
- 3.6 eMobility infrastructure end-to-end solutions
- 3.7 E-Car Operation Center
- 3.8 Building Technologies
- 3.9 Microgrid table

4.0 Digital Twin

- 4.1 Electrical Digital Twin
- 4.2 Streamlined renewable integration analysis with GIS data

5.0 Intelligent grids

- 5.1 Spectrum Power ADMS and ANM
- 5.2 EnergyIP LV OMS
- 5.3 8DAB MV switchgear solutions
- 5.4 Medium-Voltage switchgear showcase 8DAB
- 5.5 Transformer presentation
- 5.6 Sensformer model
- 5.7 Overhead Line Inspection
- 5.8 Asset management and condition monitoring
- 5.9 Connecting grids (MVDC, Mobile Statcom, SVC PLUS)
- 5.10 SVC PLUS Frequency Stabilizer model
- 5.11 PV eBoP
- 5.12 PV eBoP showcase

6.0 Secure metering operations to billing

- 6.1 EnergyIP MDM
- 6.2 Smart meters + Substation Gateway
- 6.3 Metering Operation Center
- 6.4 EnergyIP Prepay and Cloud Services

7.0 Other topics

- 7.1 Power Academy
- 7.2 Reyrolle / partner management
- 7.3 Project Aspern

See you later?!

Meet us at our booth European Utility Week 2018



- Explore our full range
- Get into details
- Talk to our experts